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*Notes upon a Tour in the Sikkim Himalayah Mountains, undertaken for the purpose of ascertaining the Geological Formation of Kunchinjinga and of the perpetually snow-covered peaks in its vicinity.*  
—By Captain WALTER STANHOPE SHERWILL, Revenue Surveyor.

(Concluded from page 570.)

August 10th, 1852.—Direction north, still along the crest of Singaleelah; started at 7 A. M. on a beautiful sunny morning, the weather delicious and the air very pure, of which I took advantage, and obtained the following bearings; Tassiding Goompa east, Darjeeling south-east, the houses being quite distinct and visible, and only twenty-four miles distant by direct distance, but these twenty-four miles have cost us seven long and laborious marches, or at the very lowest computation, one hundred and forty-five miles of windings and twistings of ascents and descents. Tendong\* mountain E.  $11^{\circ}$  S. The survey Flag Staff on the Tonglo† mountain S.  $11^{\circ}$  E. Sundhukphoo mountain S.  $11^{\circ}$  W.

To the south-east the Teesta river was distinctly visible in the plains south of the Morung Forest. To the north Kunchinjinga towered over the high peaks of Singaleelah.

Looking to the west, the snowy range of Nepal, grander in its proportions, if any thing, than the Darjeeling range, Kunchinjinga always excepted, and the cultivated valleys of Nepal and some very remarkable rocky and sterile peaks standing between the perpetual snows and the upper limits of vegetation, presented us with a view

\* Ten "permanent," Dong "resting-place."

† Tonglo "Cotton tree."

that very speedily made us forget all the labour we had gone through the previous week. As we proceeded we looked down into the deep blue valley of the Rungbi, which at this point is about 10,000 feet deep. The eye, in looking down these stupendous valleys, wanders from the tough arctic lichen and snow rhododendron at the observer's feet over fine forests of fir trees, rhododendron, birch, oak, on the slopes of the mountains, down to the tropical trees and plants, plantains, bamboos and gigantic grasses in the valleys. The scenery was now rapidly changing; instead of the suffocating heat of the valleys with their abundant tropical vegetation, we were breathing a bracing pure air, with the Thermometer standing at  $41^{\circ}$ ; the trees were small; of soil there was but a very scanty sprinkling under our feet, and looking either to the east or the west a wild confused snowy scene, treeless mountains, rocky peaks destitute of vegetation, bare precipices and deep—profoundly deep—valleys had replaced our hitherto confined view.

At 8-30 we arrived at a foot path descending towards Nepal; at this spot were the remains of a Gurung's hut and a small shallow pool of water measuring 150 by 30 feet.

At this spot I measured a cherry tree and ascertained it to be twelve feet in circumference. Plants and trees met with this morning were rhododendrons of many kinds, from the rhododendron with a leaf fourteen inches in length with a deep ferruginous tinge on the under side of the leaf to the small aromatic rhododendron with a leaf only  $\frac{1}{8}$ th of an inch in length, bearing a purple flower; yellow hearts-ease, rose, hypericum of several kinds, one thorny with a yellow flower, thistle, hemlock, yellow-flowered potentilla, dock garlic with a pink flower, and many others.

The sheep track to-day was almost entirely over bare gneiss rock, in which were fine crystals of schorl.

During this march we passed several caves in the gneiss called by the Lepchas, L'haps, into which they, with solemn faces assured us, their Lamas can with a lighted candle in hand, travel subterraneously from one mountain to another—no one besides the Lamas possessing this faculty.

At 11 A. M. we came upon the tracks of the Sippiyook or wild sheep, an enormous animal judging by his foot-print, at a spot where



the ridge of Singaleelah is split into two ridges, the whole being composed of precipices and naked masses of gneiss rock affording in its crevices a place for a sweetly scented rhododendron, a pretty white primula and a large ox-eye looking compositæ flower growing upon a long stem. For half an hour after leaving this curious spot, our track lay under a vast precipice of gneiss from which the earthquakes, which are so frequent in these mountains, have hurled down large masses of rock, and in this dangerous spot the Gurungs have ventured to erect their huts even under the most dangerous and incoherent rocks. The whole face of the precipice is split into cuboidal masses, piled one upon the other and which threaten hourly descent. In one of the detached cubes of gneiss I noticed a band of greenstone six inches in width extending for sixty feet along the front of the rock. Under this insecure-looking rock were the remains of a Gurung encampment. This mountain is the Dumdongla of Hooker; a footpath leading from Sikkim towards Nepal, here crosses Singaleelah and is called the Dumdongla pass.

At 2 P. M. we again regained the crest of Singaleelah, where we saw an old springe set for the capture of pheasants; a few minutes afterwards a covey rose close to us, from which I managed to bag a brace; of these welcome birds our Lepchas made us a delicious curry in the evening, the first hot meal we had had for nine days.

Encamped for the night at the southern foot of Kanglanamo mountain at an elevation of 12,317 feet in a dense fog which during the night condensed into heavy rain. At the foot of this mountain the Lepchas collected a quantity of a white lichen which grows in long white filaments; they called it, Búkh; it is used as incense to burn before their gods.

*August 11th, 1852.*—A most lovely clear morning, the perpetual snow is only eight miles ahead of us; the air very cold, Thermometer standing at 41° at sunrise; half an hour's walking brought us at 7.45 A. M. to the base of the conical-shaped Kanglanamo, and three quarters of an hour more and we stood upon the summit at about 13,000 feet elevation towering over every peak to the south. At the base of the mountain there are quantities of a dark and glossy hornblende slate mixed with the gneiss apparently split and fractured by the snow and frost of winter. In Hooker's Map of

Sikkim, Kanglanamo is made to appear covered with perpetual snow ; this is a mistake, as I found the following plants on its summit and no snow ; yellow and purple aromatic rhododendrons and another kind, rose, *pyrus americana*, and many small flowers.

The stratification of the gneiss at this elevation is perfectly horizontal, and in no way contorted, as it is at 7,000 feet and lower—associated with the gneiss on Kanglanamo is much hornblende and a black micaceous slate, green felspar, veins of snow-white quartz and masses of black mica.

The view from the summit of Kanglanamo is very extensive, embracing as it does nearly two hundred miles of the Nepal snowy range, and showing the junction of Kunchinjinga with the Nepal range : a sharp peak bearing a little to the north of west, distant 200 miles, that has been visible for two days, but has barely altered its bearing I imagine to be Gosainthan mountain, directly north of Catmandu ; so that from Gosainthan mountain on the west round by the Nepal snowy range passing round by Kunchinjinga, Pundeem, the eastern snowy range down southward to Cholah—we had a glorious panorama of three hundred miles of perpetual snow, peak towering above peak, all approach to which appears guarded by steep, precipitous and bare rocky mountains. Looking to the south the plains of Bengal appear but a very few miles distant, although sixty miles removed, and on a very clear day the Rajmuhul Hills south of the Ganges distant 165 miles must be visible, as they are from lower elevations. Chumulari could not be seen, though I searched well for him—probably haze or clouds shut him out from our view. On the north-west we could see the Wallanchun and Kanglachema passes into Tibet, forty miles distant. Over these passes salt is brought from the salt lakes in Tibet. The salt is laden first upon men's backs, who with much difficulty convey it over a dangerous portion of the pass, it is then transferred to the backs of sheep who convey it over the narrow footpaths of the great elevations ; from the sheep it is transferred to yaks, from yaks to bullocks and eventually, when nearing the plains, it is transferred to carts.

There is a strange prophecy amongst the Bhotias concerning these salt lakes, it is as follows : In the salt lake region there is one large lake from which no salt has hitherto been obtained by reason

of the great quantity of water in the lake ; this lake it is prophesied will in time dry up as the others have done, and that when salt can be procured from the lake, it will be carried away over the passes by a white nation who will come from the south, and who will seize upon the lakes as their own.

The lake is said to have commenced drying up lately, and it is expected that salt will be obtainable from it in a few years.

One European and only one (Dr. Hooker) has visited these passes.

One mountain in the Nepal range is a most remarkable object, both for its curious shape and for its immense height, its name none of my party knew, nor have I yet succeeded in obtaining the name. The peak is a hollow crater-like mountain probably 27,000 feet in height with a long table-mountain attached to it, both covered with glaciers. To the west of this great mountain are five distinct peaks separating the large mountain from a hollow shell-like and perpendicular mountain about 26,000 feet in height. The morning sun shining upon this mass of snow, gave it the appearance of a gigantic pearl-shell set upon its edge, the snow on the surface being of a bright pink colour. From the peculiar hollow curved and perpendicular nature of this mountain, it resembles the crater of a Volcano broken down on one side ; beneath this range of snowy mountains there is a range of bare mountains of a deep red colour about 19,000 feet in height, broken into thousands of ravines, and totally destitute of vegetation.

At 9 A. M. we got a glimpse of an inhabited Gurung's hut far away upon a lofty mountain in Nepal, the flocks of white sheep looking like small patches upon the mountain side.

At a small trickle of water where we halted to breakfast, long slender and entirely white worms were abundant in the water ; they resembled long pieces of white thread. The Lepchas seemed to hold them in great dread, and would on no account touch them. The crest of Singaleelah at this spot is a precipitous jagged and rocky mountain which necessitated us to descend several hundred feet into the Nepal territory. At 11 A. M. the path led us through a swampy tract of country with several pools of good water, numerous streams flowing to the westward over slaty gneiss. On a patch of luxuriant grass near the pools of water, I turned out from under a

slab of gneiss, one of those curious little animals the *Neodon sikkimensis* whose habits and proportions resemble that of the *Arvicola*, but the tail is comparatively short; length from snout to the root of the tail five inches—of the tail  $1\frac{1}{2}$  inch. This genus was discovered by Mr. B. H. Hodgson in Upper India. From amongst the rhododendron bushes, we put up a large number of the beautiful scarlet-legged and three-spurred pheasants, of which I only bagged one; in the marshy ground great quantities of a beautiful primrose were in full blossom—also chrysanthemum, a blue dock, dwarf rhododendrons, grass in abundance, many beautiful flowers and potentilla; as we were admiring these beauties, we heard the deep barking of the Gurung's dogs betokening the vicinity to one of their large flocks. A Nepalese of our party was sent on ahead to have the fierce dogs called off, or the better part of our party would have been torn to pieces by these ferocious brutes. We soon came up to the Gurungs seven in number, fine athletic looking Hindus with very scant clothing. They stood in the midst of their flock of three hundred sheep surrounded by their fine-looking dogs which resemble the Newfoundland breed. These shepherds had pitched their one long mat-hut twenty feet in length upon a grassy knoll under the shadow of some rhododendron trees. They called the country *Is-sunghee*, and said that they were moving downwards, having consumed all the grass nearer the snows. Their sheep, which are of a very large breed, were in excellent condition, and some of the wethers of a size unknown in England; they asked eight rupees for a large wether, from whose carcass twenty men might have been well fed. In the hut we found the Sirdar or chief, *Pahulmun* by name, of *Chynepoor* in Nepal; he told me that he had five brothers each owning a flock of sheep, and that they were all upon the neighbouring mountains. The wool from these sheep is converted into very good blankets, several of which I saw in the tent—the Gurungs appeared to be well fed, their food consisting of mutton and Indian corn, heaps of the latter were being weighed out in the tent prior to being cooked for dinner. The men had an abundance of good brass cooking pots and blankets, and the Sirdar was armed with a handsome silver-mounted kookree or Nepal knife:—snow falls here early in October—elevation about 12,000 feet.



Not being able to come to any terms about the purchase of some sheep, we left the Gurung's hut, and descended a few hundred feet under the guidance of one of the Gurungs to a fir forest, from whence we again ascended and encamped at one p. m. upon a grassy mountain covered with sheep tracks and overhanging the deep valley of the Yung-ya river. We were above the line of firs at 12,109 feet, Thermometer 56°, my breathing was very much affected, and it was with great difficulty I managed the last ascent, and with greater difficulty I managed to bag a beautiful scarlet-legged pheasant. Our Lepchas, who are the most timid of mortals, appeared rather frightened at being in Nepal, especially as the Gurung Sirdar had been questioning them as to the meaning of our party coming into Nepal. He was informed that the rocky nature of the summit of Singaleelah was the reason we were in the Nepal territory, and that had it been possible to have avoided crossing the Sikkim boundary, we would not have done so. The Sirdar said, it was all very well talking, but he knew very well that we had come to examine the boundary, and that he would report our party to the Nepal Durbar, which we suppose he did, as we saw a messenger depart that very afternoon towards the west.

Towards the evening the Gurungs brought some dead sheep for sale that had been killed on account of sickness produced by eating the aconitum. The Gurungs watch the animal that has partaken of this deadly plant, and if they find there is no chance of its living, its throat is cut and the carcass eaten. The wool is first cut off close and the stumps singed until the animal appears dressed in parchment. Strange to say the Lepchas, who will eat snakes, frogs and other extraordinary food, would not partake of these diseased sheep, the two carcasses therefore that I purchased were made over to the Nepalese Hindoo coolies, four in number, who consumed the two sheep in two days.

Across a deep valley immediately opposite or west of our small encampment, was an immense cascade falling by a succession of leaps from upwards of 3,000 feet down into the valley of the Yung-ya river. To our east the ragged and serrated crest of Singaleelah rose some thousand feet above us, the horizontal masses of gneiss being destitute of any vegetation. About 2,000 feet above our camp,

upon the Singaleelah slopes I discerned several white objects like men; I sent off a Lepcha for one, and it turned out to be a mountain rhubarb plant, one of the handsomest botanical objects I ever remember to have seen. It consists of a conical assemblage of buff-coloured leaves of great beauty elegantly crimped, and edged with pink; the whole growing upon a substantial stem, upon which and hidden by the graceful leaves are bundles of flowers and triangular seeds somewhat resembling mignonette—the plant measures forty-five inches in diameter at the base of the cone, and is about the same height. The Lepchas call it "*Chookoor Dong*;" the stem is eaten by the Hill people, it is extremely acid and astringent.

*August 12th, 1852.* Woodcocks were heard overhead at day-break. Further south upon the summit of Singaleelah there are a considerable number of these birds.

Started at 6 A. M. Thermometer  $41^{\circ}$ , our road was up a narrow grassy gorge in the mountain; some of the snowy peaks were seen peering over the tail of Kubra on our left, about five miles distant—a few hundred feet rise, brought us to the top of the Kanglanamo pass, a gap in the crest of Singaleelah, affording during the summer months a means of communication between Sikkim and Nepal. This is the pass, so I have been informed, by which Dr. Hooker endeavoured to force his way from Nepal to Sikkim, but was prevented by the deep snow. The pass I calculate to be 12,600 feet, but I did not take the height.

The rocks on the crest of Singaleelah at the pass are of horizontal gneiss, castellated and shattered by the frost, on the right hand side of the pass the rock has been worn into the very image of a man sitting with his hands upon his knees, dressed in a robe and crowned with a Scotch cap with a conspicuous tuft on its top. The whole figure is about fourteen feet in height; the figure by all parties was declared to be the Rajah of Sikkim guarding his boundary.

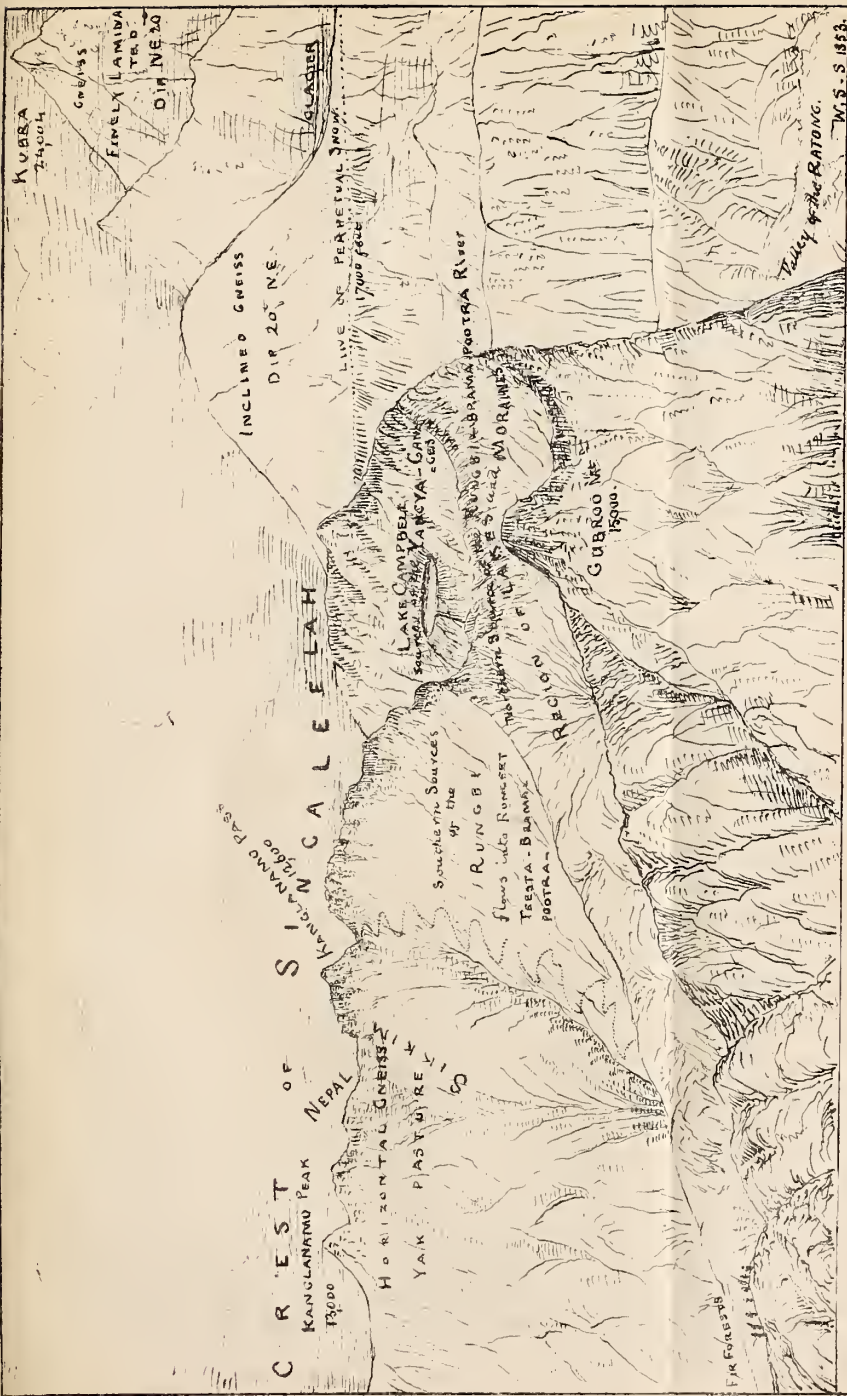
From the pass, the weather being very fine and the air clear, we had an extensive view of the plains, the Teesta river, the eastern snowy range and of Darjeeling, which latter mountain is a fine object from whatever side it is observed. Darjeeling bore south  $22^{\circ}$  east, Tendong mountain south-east by east; we were considerably to the north of several of the snowy peaks—we now left the footpath which



The 'Chookor Dong' or Mountain Rhubarb, found at 14,000 Feet Elevation.







A DISTORTED SKETCH showing the SUDDEN TERMINATION of the GREAT SINGALEELAH SPUR at foot of the PERPETUAL SNOW.



descends in an easterly direction from the pass, crosses the Rungbi to Yangpoong, to seramble in a northerly direction over naked rocks under the eastern crest of Singaleelah; these rocks have been hurled from the castellated crest by the severe frosts of winter; the stratification of the gneiss being perfectly horizontal, and the individual strata exceeding minute; the Lepchas named the blocks "Lama's books" which indeed they resemble—one of these blocks fifteen feet in height and thirty in length, was traversed by a band of white quartz a foot thick, and being of a less perishable nature than the gneiss, it stood out in bold relief at each end of the block. A thousand feet below us, we saw some pools of water standing in the midst of fine grass pasture land, the property of the Sikkim Rajah, and where his herds of yaks graze in the month of September; several stone huts were scattered about the pasture, where the yak herds shelter themselves during the night. At the present the yaks were five miles to the north at Jongri, immediately under the snow, or three days' journey from this. One mile of this rough and slippery serambling brought us again to the crest of Singaleelah, where, to my amazement I discovered that the Singaleelah range breaks off suddenly, and that I stood upon the edge of a steep descent several thousand feet deep. Singaleelah at this spot sweeps round to the east by a great bend of one mile, and terminates in a spur that points to the south, separating the two main sources of the Rungbi river. From nearly the centre of the great curve, a narrow wall-like ledge much below the crest of Singaleelah runs to the north, and forms the only apparent connection of Singaleelah with the snows. Looking down into the deep valleys to the right and to the left, whose waters are separated by the narrow ledge above-mentioned, the eye rests upon a curious scene; the valleys, destitute of any vegetation and filled with pools of water, have been scoured from end to end by the action of either heavy masses of moving snow or by glaciers, the loose rocks are piled up in confusion, in some places, to the height of several hundred feet. The whole scene is one of ruin and desolation—not a shrub or a plant is seen, nothing but a region of loosely piled up gneiss rocks. From this spot looking to the north-west or across the deep valley at our feet, a fine lake about a mile in length is seen perched up in a strange position upon

a high level plateau in the mountain. The water, partaking of the colour of the naked rocks that rose behind it for several thousand feet, was almost black ; its shores were rocky, dark and gloomy.

From this lake the Yungya, a feeder of the Tambur river in Nepal, takes its rise, and is seen leaving the lake by a fine cascade of 3,000 feet fall. As this lake had never been seen by any European, I have named it "*Lake Campbell*," after my esteemed friend Dr. A. Campbell at Darjeeling.

From this strange spot we descended to the east of the narrow ledge and found ourselves in a deep hollow, full of pools of water, and the whole surface of the valley one large moraine, the rocks of which have been driven about and piled up in wild confusion. Temperature of air at 10 A. M. was 58° of water 52°.

I was enabled this day to make some slight additions to Dr. Hooker's valuable Map of Sikkim—especially as this immediate spot was not visited by that intelligent traveller.

Encamped at 1 P. M. upon moss and lichen covered rocks at an elevation of 14,229 feet—we had been scrambling over these loose gneiss rocks for hours, and as we had splitting headaches, we were delighted to halt, although the poor Lepchas had no wood to cook their food. The rarefaction of the air is beginning to tell upon us ; bleeding at the nose, a tightness across the back of the head, is what I most suffer from. The exertion of writing, making a false step amongst the rocks, of addressing any one, stooping to tie the shoe, or performing any act requiring but moderate exertion, is productive of the most distressing symptoms of suffocation, sharp sudden pains in the chest, extreme beating of the heart, and violent action of the lungs, which being fed with a thin and rarefied air, have to work hard to keep the blood purified. I have been so prostrated this day as to be fit for nothing, which is the more strange as our elevation is not a very great one ; but from all I can gather from travellers in the Himalayah, I suspect that the sufferings of travellers commencing as they do from this elevation, are more acute and more noticed as being something new and at first very alarming. One of our Nepal coolies is in great agony, moaning in a most piteous manner. During the afternoon, rain and fog shut us out from all the world. In the sheltered spots I found dwarf rhododendron, a few primroses



a butter-cup-like plant, the conical rhubarb, two andromeda, one with a pretty white bell the very image of a true heath—and juniper, a few sticks of which latter tree were brought up from a distance by the Lepchas, and with them water was boiled with some difficulty at 189° 50, or 14,229 feet.

A pheasant got up from amongst the rocks, which I fired at and bagged; the concussion of the air was so intolerable and stunning, and so painful, that I was obliged to lie down for some hours before I got over it.

The fog clearing away we were enabled to see that we were in the midst of a scene of desolation and chaos, ragged rocks, black slate, moraines, land slips and steep cliffs were all that met our view *near* us, but to the south the plains and the intermediate ranges of mountains were all spread out before us. To the east of our encampment about one mile distant, we gradually saw the rounded mountain Gubroo, 15,000 feet, emerge from the clouds. To the north we could see nothing, as we were at some distance from the crest of a high ridge, that leaves the foot of Gubroo and sweeping round to the west, joins the high black mountains on which "*Lake Campbell*" is situated.

Somewhat to our astonishment we found our tent was only a few feet removed from a precipice 300 feet deep, had one of the furious blasts of wind that are common at this elevation descended from the snows, our tent would have been hurled over the precipice and received at the bottom in a deep pool of water a few hundred feet across. Thirty feet from the shore and at the depth of twenty feet I could see rocks around, whilst the water from its great depth was quite black.—A bright sun was shining overhead which would have enabled me to see the bottom perhaps at fifty feet, had the pool been so shallow. These pools during the winter are entirely frozen and covered with snow, one hundred feet deep or more, which is drifted from the heights above—when this large body of snow begins to melt in the spring and summer, the rocks lying under it are pushed along with the descending mass and are heaped and piled up as we saw them. These pools form the sources of the Rungbi river which, after a course of thirty-five miles through deep valleys, falls into the great Rungeet under Rinchinpoong.

*August 13th, 1852.* Leaving our tents, baggage and people at the encampment we ascended the loose rocky ridge to the north of us, the summit of which, 14,500 feet, we reached in half an hour; the sight that met our gaze from the top was a scene of grandeur I had never expected to see. The whole of the snowy mountains seen from Darjeeling were close to us, Kubra, 24,004 feet in height, appeared hanging over us although two and a half miles distant, but all progress northward was completely cut off, we were on the edge of a precipice many thousands of feet deep, at the bottom of which was a narrow valley running east and west with a handsome lake to the east, the water from which runs round the foot of Gubroo and falls into the Ratong. Across this valley a small ledge of rocks connects the semi-circular ridge of Gubroo with the foot of Kubra. Three similar chasms all running south-east, north-west, separated us from the perpetual snow on Kubra. The sides of the chasms are composed of a dark slaty rock, containing much hornblende, the sides being too precipitous to allow snow to rest upon them. The first and second ridges had no snow on them, the third had patches only of snow, the fourth was covered with perpetual snow, one and a half mile distant from us. These ridges are buttresses, descending from Kubra and terminate in the Ratong valley.

The Thermometer stood at  $34^{\circ}$ ; the air was quite clear and bracing, allowing us a free view of the plains, Darjeeling, Nepal, the eastern snowy range and of the giant peaks to the north of us. *No aid from a telescope was required to show me that the whole of the large snow-covered mountains, Kunchinjunga, Pundecm, Kubra and Junnoo are composed of a finely stratified rock to their very summits.* By the aid of a telescope, the stratification of Kunchinjunga was very distinct, both in the large naked spot, now only ten and a half miles distant, and mentioned in the first page of my diary as having been caused by the earthquake of May, as well as at the very summit which is not covered with snow, but with a pellicle of ice, snow only resting upon the ledges and peaks. The strata, which are very small and minute, dip to the north-east about  $20^{\circ}$ , all the large peaks presented the same appearance. The rocks of the Gubroo range are composed of a hard flinty parallel gneiss intermixed with much black or blue hornblende and micaceous slate, the gneiss everywhere splitting into very thin laminae as thin as roofing slates.

Immediately to the west of Gubroo, the rocks dip to the south-west at an angle of  $30^{\circ}$ .

The dip of the strata upon the Gubroo ridge being to the south-west, and the northern face of the ridge being nearly precipitous, a great flow of water takes place towards the south, the whole surface of the mountain is divided with numerous steppes, each steppe having pools of water resting upon them averaging from one hundred to four hundred yards broad—and many of them surrounded by steep walls of a fine slaty gneiss composed of hornblende, white quartz and felspar; from these pools there is a constant discharge of icy cold water which flowing away south form the Rungbi river.

From the crest of the Gubroo range, we could see a yak herd's encampment in the direction of Jongri, or north-east of where we stood, many thousand feet below us and separated by several deep valleys.

Kunchinjinga, 28,177\* feet above the sea was  $10\frac{1}{2}$  miles distant.

Pundeem,.....22,015*	ditto ditto	7	ditto.
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Kubra, .....24,004*	ditto ditto	3	ditto.
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Nursing, .....19,139*	ditto ditto	12	ditto.
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Tuchcham, ...14,000 (?)	ditto ditto	27	ditto.
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We were six miles north of Nursing; this peak from Darjeeling has the appearance of rather a blunt rounded mountain, but from our position it was an exceedingly sharp pointed peak, run into a very fine point. None of the numerous glaciers that abound at the foot of all the great peaks and in the valleys separating them, could be seen, being completely hidden by the sharp slaty ridges above mentioned.

From the nature of the mountains surrounding Kunchinjinga, I felt convinced that any nearer approach to the great peak would hide him altogether, I therefore determined upon returning. Sitting on the ground with a rock to support my back, I with much difficulty, from the pain I was suffering from the rarefaction of the air, took a sketch of the snowy range from the most northerly attained spot in our journey, and having given one more look round this grand and wintry scene, we turned our backs upon the snow and descended to our tents at which we arrived, very cold, at 7 A. M.

August being the month at which the snow is probably at its

\* Heights ascertained by Lt. Colonel Waugh, Surveyor General.

highest elevation, I was enabled by a series of bearings to lay down a correct outline upon Dr. Hooker's Map of the snow line in the height of summer, and which from careful observations I calculated to be about 17,000 feet; but some of the glaciers are far below this elevation, probably not higher than 12,500 feet. The great glacier at the foot of Kunchinjinga, visible from Darjeeling, is elevated about 16,000 feet.

At 8 A. M. we left our encampment and descended in a southerly direction over the loose rocks, crossing many running streams and pools of water. I particularly remarked, and that after repeated examinations, that none of these pools contained any living animal, either fish or animalculæ, nor had they any weeds, grass, nor indeed any organic matter in them. The only living things to be seen were two minute wrens hopping about the rocks. At 9 A. M. we reached a path, or rather a track marked out by the yak herdsman by erecting large stones within sight of each other; upon a fall of snow occurring, these form their only guides through this wilderness of loose rocks; to us they were invaluable, as no one of our party had ever been where we were now threading our way, in the midst of a thick fog that obscured everything from our view. From the rocks we commenced ascending the ridge of which Gubroo forms the northern culminant point, and which separates the waters of the Ratong and Rungbi rivers. At 9.30 we reached the summit of the ridge, which to the east is precipitous, descending to the Ratong by a steep fall of about 8,000 feet. Looking back into the rocky basin we had left, and from which the fog had blown off, the view was very wild and interesting. Several landslips have taken place upon Singaleelah, uprooting large tracts of fir forest, some of which trees were seen with their roots in the air, their fine stems shivered and torn by the falling rocks.

We were much disappointed in not being able to see the view from the eastern face of the Gubroo range, as from our position, we should have been enabled to comprehend in one view all the glaciers lying at the foot of Kunchinjinga and Pundeem mountains, probably twelve in number, the nearest being five miles distant, as well as Jongri, situated upon one of the swelling buttresses of Kunchinjinga overhanging the right bank of the Ratong. Jongri



is a yak herd's summer-post, consisting of several stone houses at a probable elevation of 14,000 feet, and is the highest spot in this region where yaks are grazed during the summer months. From Darjeeling I was enabled during some very clear weather in October and by the aid of a glass, to fix the true position of Jongri. In Dr. Hooker's Map, Yangpoong is called Jongri. Perhaps the meaning of the name Jongri applies to both places, in which case Dr. Hooker's Map would merely represent an omission of the site Jongri and not a mistake. From these glaciers flow many streams, the united water of which forms the Ratong, a feeder of the great Rungeet. The eastern face of the Gubroo range is a handsome object in the view from Darjeeling, from whence it is seen as a bare, rocky, precipitous mountain. About 10 A. M. we reached a spot upon the almost bare rocks where there stands a yak herd's stone house composed of large slabs of gneiss rocks, some of the slabs being five feet in length. The house which is in a rather dilapidated condition, was supported by wooden posts, and was surrounded by a low stone wall;—we halted for breakfast;—in amongst the rocks, I noticed rhododendrons, blind nettles, rue, primrose, chrysanthemum, rose, dwarf rhododendron, fennel, geranium, polygona, dock and potentilla. This stone-house is a resting-place for the herdsmen and cattle when on their way from the valleys of Sikkim to Singaleelah.

We now commenced a rapid descent, and at 11.20 A. M. we reached Yangpoong, several hundred feet removed from the crest of the Gubroo range or upon the western slope of the mountain on a level with the fir forest or about 12,000 feet. Yangpoong consists of two large stone-houses covered with shingle, and a ruined house, this latter probably a kraal for enclosing cattle, an extensive mendong, covered with carved slabs and two tall flagstaves, bearing cloth flags covered with printed prayers. The inhabitants had gone to the north or to Jongri, so we examined their houses whose doors were merely tied up with a piece of string. We found the houses large, commodious and well filled with the usual Bhotia furniture, amongst which were some fine drums, trumpets and brass vessels. Though my Lepchas and Bhotias wandered about the houses examining and making fun of everything they could lay their hands upon, nothing was taken away, but my guide begged of me to take a large

pair of yak horns that were nailed to a post in the house. I had shown some desire to take back a good pair with me, but I could not consent in the absence of the owner to remove them, especially as they were evidently prized by the herdsmen from their superior size and shape.

Underneath the houses, which were built after the usual Bhotia fashion, there was accommodation for the yak calves.

From Yangpoong the descent was rapid, in the morning we had stood where nothing grew except a minute golden lichen, we were now at noon in a handsome forest, having passed rapidly through the various botanical grades of lichen, small flowers, juniper, rhododendron, fir, oaks, chesnut, to our tormentors the leeches. At noon we passed a small stone-altar called "*Mon Lepcha*" erected by the Lepchas, in honour of the "principle of evil;" we put up in a yak herd's hut on the left bank of the Rungbi, close to where it is joined by a fine stream flowing from the mountains to the east.

*August 14th, 1852.* Started at 6.15 A. M. in a southerly direction crossing the Rungbi over a handsome bridge close to our encampment. These bridges consist of a few saplings, their thicker ends being stepped under heavy stones, their lighter ends are brought together and form the crown of an arch; from this arch, loops of creepers hang down, into which one single sapling is laid, and forms the platform along which the traveller walks—we were now in a deep valley flanked on the west by the lofty Singaleelah, and on the east by the Catsuperri mountains, our path lay through a heavy forest a few feet above the Rungbi, a fine broad river full of rapids and water falls.

At 11 A. M. we arrived at a small patch of cultivation showing that we had descended 9,000 feet since yesterday morning. At this spot I measured one of the large black epiræ bird eating spiders, and found him to be eight inches across the legs; at 11.30 A. M. we reached Rungbi a Limboo clearance with four houses, near which was a small stone altar and some handsome trees of the fir species with very fine leaves.

In the deep valley of the Rungbi we met a party of Limboos, men, women and children all busy poisoning fish in the stream—our sudden appearance in the narrow path running through a thick tropi-

cal underwood seemed to take them by surprise. One old man carried a pot of tobacco and water in his hand, with which he continually anointed the leeches as they crept upon his naked legs, the first application caused the animals to roll off as if in agony.

At 2 P. M. after a very fatiguing march we arrived at two Limboo huts, perched up about 1,000 feet above the river, and commanding a fine view down the stream, which here turns off the east, flowing between the Pemionchi and Catsuperri mountains. The northern flank of Pemionchi is much less steep than its southern or Kullait river-side. Looking up the Rungbi, nothing is visible but a deep dark forest-choked glen, down which the Rungbi could be heard roaring. Near Rungbi we saw a very beautiful waterfall, the fall was only twenty-four feet in height, but the arrangement of the rocks and forests and the numerous streams into which the fall was broken, quite made up for its small height.

We put up for the night at a Limboo clearance where the Soobah of the Rungbi valley resides, and where, upon our arrival, he was, in honour of the harvest, keeping up great festivities. The whole population amounting to about ten men and four or five women besides children, were all more or less intoxicated; it was a long time before we could get a hearing on account of the music and dancing, shouting and screaming that was going on inside the principal house; at last they all tumbled out, and the soobah, a good-natured creature, at the head of the party, led us away to a nice house, which was forthwith swept out and cleaned and a fire lighted for us. Two bamboos of chee, a fowl, milk and rice were sent from the banquet, upon which we regaled ourselves, our sixteen attendants formed a grand addition to the party who were with much cordiality invited to see the dancing and to partake of chee, which they did with a will; for before midnight the whole of them were fast asleep and very drunk.

I sent my compliments across to the soobah to say I should like to see what was going on; he forthwith came himself, conducted us into his fine house, where there were about thirty men and women sitting on the ground, hot chee was being served round to every one and in the middle of the room a young girl highly excited and most fantastically dressed was dancing to the beat of several drums. The

girl was dressed in a pretty coloured petticoat with two cross belts of cloth covered with cowrie-shells thrown across her shoulders, from which depended on the back two skirts almost touching the ground and fringed with the teeth of the wild boar, deer, and bear, the dried heads and beaks of a handsome bird, of the scarlet pheasant, and other birds heads, seeds, pheasants spurs, and bears claws, and her head was ornamented with long cocks' tail feathers. The dance, which was a slow monotonous shuffle at first, increased in spirit as the drums beat louder, the girl moving gracefully to the time faster and faster until she got into a perfect frenzy, wheeling round the room and the fire places at a fearful pace, the men's heads keeping time to her dance; shouts, and beating of drums increased the girl's pace until unable to controul herself, she dashed into the midst of a large fire that was burning in the middle of the room, and with her naked feet sent the fire flying all over the room, nor were her hands idle, for she commenced tearing down a hanging frame-work upon which all the household cooking apparatus and property is generally slung; the women of the house rushed forward to save their property, the men to put out the burning brands; all was uproar and confusion during which moment we slipped out. The next morning I sent for the little dancing maniac, she came in full dress, but was as demure and quiet as any Limboo damsel possibly could be. I examined her dress, and marvelled how so slight a creature could dance, and at such a pace with the enormous weight of cowries and cloth that encumbered her body.

*August 15th, 1852.*—Four hours' quick walking in an easterly direction through forest, brought us to the summit of the Pemionchi mountain.

At 10 A. M. we reached the monastery of Chanachelling, or as the Lepchas call it Sauachelling. It is a remarkable and curious looking stone building three stories high, pierced with doors and windows, ornamented with paint, horse-hair curtains, hanging balconies and flights of stone stairs. The southern side faces a garden which is enclosed by a stone wall, beyond which are several handsome chaitans or stone monuments. The goompa or monastery is thatched, the edges of the thatch are secured by long ratans being tied to it at all points and pegged into the ground; this is to guard against



the high winds that sometimes sweep across these mountains with resistless force. Chanachelling is a monastery for women, but since the Rajah's disgraceful conduct towards Drs. Campbell and Hooker when travelling in his country—which, together with the Rajah's refusal to deliver up his Dewan, the principal instigator in the outrage, and on which account the two Morung Purgunnahs lying at the foot of the hills and yielding a yearly revenue of 23,000 rupees, and that portion of the hills now known as the Darjeeling Territory, and for which the Rajah received 3,000 per annum from the British Government, were confiscated from the Rajah,—the yearly allowance hitherto granted by the Durbar to the Goompa has been stopped, and we found that all the nuns had gone over the snows to Choombi in Tibet, leaving one Lama in charge of the vast house, its library, images and religious furniture. The interior of the house was as curious as its exterior. The portico at the entrance of the Goompa has the walls painted with a series of figures larger than life in the true Chinese style ;—bright colours, bad perspective and extravagant action. The drawings represent Chinese officers of various grades bringing in frantic haste presents, such as strings of precious stones and other rare articles to a group of images in an inner room, the figures are so painted that they appear hastening into the room where a grand idol sits, flanked on either side by smaller images. The eyes of one of the mandarins or high officers were so painted that they really looked as if they were about to spring out of their sockets. The tension of the eye-ball was remarkably well-painted. The flowing drapery, the armour, faces and jewels upon the figures were all very well and minutely painted.

In the praying room up stairs, thirty-six feet long by thirty broad, were arranged round the book-cases for the reception of the books of prayers of which I counted 86 volumes bound in silk and each labelled upon three slips of various coloured Chinese satins. The roof of the room is supported upon six handsomely carved and painted wooden pillars, carved in a truly Chinese manner ; down the eastern side of the room were ranged eight curiously carved side-tables behind which in recesses were seated twelve gods, five feet in height and painted so as to resemble life. Immediately to the left of the altar which was divested of most of its ornaments, was a

group of painted figures five feet in height, too indecent to make any further mention of. The altar consisting of a raised platform had upon it a few conch shells—brazen cups with water in them—bells—small brazen images and drums, all of Tibetan manufactory and very beautiful, especially the brass work which is chased and carved in a very minute style. Four heads of Indian corn were also hung up in front of the altar. In one corner of the room stood a prayer-drum five feet in height and supported between strong upright wooden posts. Their drums called “Mane” are found with all sects of Buddhists in or near the Himalayah, they contain painted and written prayers and are made to revolve from north, round by east, the revolving Lama repeating the words “Om Mane pemi hom.” These prayer-drums vary from a few inches in length to several feet in height. The former are turned by the hand, the latter either by wheels or by water power.

The Lama left in charge of the convent could not appear, as he was undergoing either penance or was under a vow not to mingle with the world on this day; we conversed with him through a door, he speaking in the Bhotia language, our Lepchas interpreting; he sent us out nice soft rugs to sit upon, and a gallon of tea. He was most anxious that we should stay and sleep at the convent, and have a long talk with him on the morrow; he said all the brethren had experienced much pleasure from Dr. Hooker’s visit, and assured us that our having come so far to see the convent, was an honour and that we were welcome. The fact is, these monks, perched upon lofty mountains and shut out from all the world, lead a life of monotony; a traveller breaking in upon this monotony and conversing about the world, its politics and people, is warmly welcomed and treated with great kindness.

A hot walk of three miles along the crest of the mountain brought us to Pemionchi, where there is a very handsome Goompa of three stories; it is eighty feet in length by about forty broad. As we approached, we saw one of the Lamas, who was dressed in his long garnet-coloured cloth robes, beating a gong to call all the monks to prayers; we were fortunate in seeing the whole establishment go through a religious performance upon the occasion of the death of a brother monk.

About twenty intelligent looking monks old and young, all dressed in the garnet-coloured flowing robes with under clothes of richly figured Chinese silks and satins, their hair cut short, assembled at the sound of the gong; they received us with great kindness and provided us with seats at the entrance to the Goompa, where the ceremony of chanting prayers for the dead was about to take place. The walls of the vestibule in which we sat were highly ornamented with painted figures as large as life, representing a Tibetan deity on a white horse; a female deity half-woman half-snake; and another deity upon some frightful beast.

Looking through the capacious door or up the body of the temple, the sight reminded me of a Catholic Chapel during the performance of high mass. Three pillars highly ornamented, gilt and painted, stand on either side of the aisle which terminates at the high altar, or rather a deep recess filled with eight or ten strange images as large as life. To the right of the recess there was a square metal tray, containing a hundred lights which shone brightly in the darkened room, the walls of which are painted from floor to ceiling with the likenesses of gods and goddesses, with skulls and tridents, things on earth, and with things that never were on earth, so beautifully confused and confounded that to attempt to analyze or particularize what there was or what there was not, would be a matter of difficulty. The colours were all of the brightest hues and pleasing to the eye.

On both sides of the aisle were ranged felt seats raised a foot from the ground, upon these the twenty Lamas took their seats and opened the ceremony by chanting a hymn, and finer bass voices I never heard; an old Lama sat near the altar on the right hand side and immediately in front of him and standing in the centre of the aisle was a figure dressed in the defunct Lamas clothes, a crash of cymbals, and a loud blowing upon the human thigh-bone trumpets closed each hymn, of which they chanted some twenty; two boys dressed as Lamas, during the whole of the service were very actively engaged in serving out hot chee from Tibetan metal tea-pots to the singers, who each held out his own wooden tea-cup produced from the folds of their capacious robes, and when emptied and *licked* clean, these were put back again into their breasts; near the door and close

to where we stood, incense was burning in a silver dish, a handsome silver flagon containing water also stood close to us, the flagon was of Chinese manufacture highly chased and ornamented, with two hideous Chinese dragons as its handles.

Service being over, we walked round the temple conversing with the Lamas through interpreters, our conversation lasted two hours, during which we were made to drink a quantity of chee and tea, a side of beef was also presented to us, accompanied by plantains, rice and vegetables.

The conversation was principally concerning the Rajah of Sikkim; and of his crippled condition since the British Government had deprived him of his land in the plains, the only land that yielded him any revenue; they deplored the outrage that had been committed upon Doctors Campbell and Hooker at the Cholah pass, and said that it was all the Dewan's doing, but that as the Dewan was intimately connected with the Rajah by marriage, the Rajah could not deliver him up to the British Government, when he was requested to do so. They gave me to understand that the Dewan was now a beggar, that having ruined his master, he was suffering for it. The allowance of 2,000 rupees and various presents that were annually given by the Durbar to the Pemionchi Goompa had been stopped, consequently they would all be obliged to go over the snows into Tibet, or starve. They certainly were very far from the starving point when I saw them, for a more jovial, fat, good-natured set of mortals could not be seen; they were the very pictures of jolly friars.

I particularly asked them if they had any objection to English gentlemen visiting their country and Goompas, their reply was, "None whatever: whoever will honour us with a visit, we will receive them with pleasure, give them food and a house to live in," and begged of us to pay them another visit. They said we were strange people and pointing to our legs that were bleeding from fifty leech-wounds, asked us, why we underwent such trouble, labour and misery when we might sit at home and be comfortable. "Yes" one fine intelligent Lama said, sighing: "we were all happy and at peace amongst ourselves before any English gentleman had penetrated our hills, but since then, all has gone wrong; but strange to say from no fault of yours, but of our own."



The view from Pemionchi, 7,000 feet, commands a fine view of the snowy range and of the greater part of Sikkim. Numerous Goompas perched upon mountains are seen to the east; the Rungeet river is seen 6,000 feet below and Darjeeling to the south—Tassiding Goompa appeared at our feet.

A great portion of the eastern end of the Pemionchi mountain was once encircled with a stone wall, the remains of which are still seen and was the capital of Sikkim. This place was sacked by the Goorkas, and the valuable library burnt in 1787, A. D. when the Goorkas descended the Tumbok pass (Islumbo of Hooker) and ravished the whole of Sikkim.

The summit of Pemionchi mountain is composed of mica schist of great brilliancy, shining in the sun like the nacre of a pearl oyster. The schist is not horizontal, but carved and distorted, presenting in the separation of its strata, huge conchoidal pearl-like surfaces.

Left Pemionchi at 2 P. M. passing several chaitans and descended 2,000 feet on the southern face to the great Gayzing Mendong, which is 615 feet in length, about ten in height, and as many broad; it is highly ornamented with well-carved slabs, the word “Om mane pemi hom” predominating. At the north end there stands a chaitan; and at the south end a tall flat slab of stone nine feet in height and covered with inscriptions, has been erected in a bed of masonry. The slab has had its head snapped off and just below the fracture, the writing commences. I am sorry I did not secure an impression of the inscription, but great fatigue had prostrated my strength, and I was fit for nothing.

Dr. Campbell in his journal of a trip to Sikkim—see Asiatic Society’s Journal for May, 1849—mentions that this Mendong is the largest in Sikkim—the labour that has been expended upon this wall is immense, there being no less than 708 stone slabs all elaborately carved with letters five and six inches in length, some of the legends are arranged in circles ornamented with flowers and contain other words than the usual “Om mane pemi hom;” one stone written in the Outza (Tibetan) character had the words “Om, a, húm, túm-phí” arranged in a circle. These phrases appear to have some hidden meaning, but unknown to the generality of the Lamas; however, they say that they all apply to God, each syllable bearing its own

peculiar virtue. An intelligent Lepcha with me who read the inscriptions freely, and also copied some for me, rendered the words "Om mane pemi hom" into the following prayer "Oh God receive me into Thine essence when I am going;" (dying); absorption into the divine essence being the Buddhist's idea of heaven, I have no doubt that the prayer, meaning whatever it may do in strict reality, is used by the Buddhists in that sense.

On our descent, we met a slave girl toiling up the steep ascent laden with a large bamboo full of water for the use of the monks. This girl had been kidnapped from Bengal in her infancy and had forgotten her native language, she was in good condition, fat and plump, but with a melancholy expression of countenance, an expression only seen upon the face of a slave. To prevent people being kidnapped from Bengal and from our own hill territory has long occupied the attention of our government; at every bridge leaving the British territory there is a guard; over these bridges a slave is never taken to Sikkim and no slave who may seek shelter from Sikkim is ever sent back again. Slavery and its attendant miseries have in an indirect manner been the cause of the Rajah's losing his country; mild reforms proposed by our government with regard to the existing slave-trade in Sikkim roused the anger of the Sikkim Durbar which led to direct violence offered to the person of our government representative.

*August 16th, 1852.*—Descended to the Kullait river in two hours, the path the whole way displaying mica schist; saw small red monkeys, doves, and green pigeons (koklah) in the forests.

To our annoyance we found that all the cane-bridges over the Kullait had been cut away to prevent any of the people from Hee, and the neighbouring clearances crossing to Pemionchi, the whole of the inhabitants near the southern bank of the river being more or less affected with dysentery, such is the horror and alarm with which that complaint is viewed by these people. Men were sent up and down the river for miles but without success, all the bridges had disappeared and as the river was at its height, very deep and impetuous, we were at our wits end, as I particularly wished to avoid the hot and miasmatic valley of the Rungeet, which appeared to be our only alternative. Men were again sent off down the stream to

see if there was any possibility of crossing ; a spot was at last found half a mile above the junction of the Kullait and Rungeet rivers where some gneiss rocks jutted into the river, diminishing its width considerably. Here our Lepchas, in the space of two hours, threw a strong bridge across the Kullait made of bamboos and saplings retained in position by heavy stones. It was an exciting moment when a man crawling forward upon the supple and bending bamboos overhanging the boiling headlong current below, managed to effect a junction with the opposite bank.

The rocks in the Kullait are a fine gneiss in company with masses of white quartz.

A flock of black cormorants flew up the river, as we were sitting on the rocks, watching the bird-eating spiders letting themselves drop from great heights from the branches of the trees overhanging the water, and seizing insects and flies upon the rocks. The movements of the spiders were exceedingly rapid and precise, seldom missing their prey. From a living specimen I wound off upon a piece of card a good hank of a beautiful golden yellow web, resembling floss silk, which however turned into gum upon getting wet.

At noon we crossed the Kullait and after repeated halts on account of the suffocating heat arrived at a small level clearance near the summit of Rinchinpoong, where there is a Lepcha and Bhotia village of ten houses, at an elevation of about 6,000 feet. The name of the village is Yansúnkúm, the inhabitants of which had an abundance of good cows, pigs and poultry. I was importuned to prescribe for a man suffering from dysentery ; having no medicine-chest with me was no excuse, for I was implored to make some sort of medicine to effect a cure ; I accordingly had a quantity of worm-wood gathered and pounded and stirred up in brandy, to which was added nutmegs, cinnamon, and cloves, all reduced to powder ; doses from a bottle full of this strange mixture well diluted with water were recommended to be taken three times a day.

Here, from sheer fatigue and from severe inflammation of my legs and ancles caused by leech-bites, we were obliged to halt a whole day. Let no one who has never ventured into the Himalayah mountains imagine that travelling in these mountains is anything but downright and real hard work ; it is seldom a traveller is so fortunate

as to have dry clothes on; his food is of the plainest quality and often very scanty. Dr. Hooker was reduced to coarse boiled rice and Chili vinegar; this is poor fare for a man walking up hill and down dale for ten hours a day.

*August 18th, 1852.*—Left Yansúnkúm at 6.30 A. M. and ascended to the summit of Rinchinpoong, a few hundred feet above the village—saw several chaitans on the road; all the hills near Darjeeling appear to have been, in some former age, much more densely inhabited than they are now, mendongs and chaitans appearing upon almost every ridge and peak of any note.

The rocks still mica schist. Passed the village Nam-gon-kum and commenced the descent of Rinchingpoong at 9.15 A. M.; crossed at 10.40, the torrents; Richi flowing from west to east and falling into the great Rungeet, which river we could see turbid and swollen some thousands of feet below us; commenced the ascent of Singrioong at 11 A. M. and reached the summit at 0.45 P. M.; a little to the west of the point of crossing this ridge, stands a conical peak, named Biksadong.

At 2 P. M. commenced the descent of Singrioong and by mistake taking the wrong path, we had to return 2,000 feet up a steep ascent. The heat was so overpowering, the jungle so dense, the air so quiet that a feeling of faintness crept over me, which deprived me of all strength; upon reaching the Ruttoo stream at the foot of Singrioong where it dashes over a high rock, I could not resist a plunge into the river. It was late in the day, any more ascent, worn out as we were, was impossible, and to sleep in this deep miasmatic valley was almost certain death from jungle-fever. Fatigue and the sight of the cool-stream overruled all scruples, we slept here. A fortnight subsequently, I was in bed delirious from jungle-fever, but I feel grateful that no one but myself suffered from my imprudence in sleeping in this deep valley.

On the way down Singrioong passed over one of the travertine lime deposits, common upon this spur, and upon Chakoong to the south.

In the Ruttoo are quantities of rolled and water-worn pieces of blue, pink, and other delicately tinted slates. The rock in situ is gneiss.



*August 19th, 1852.*—Left the banks of the Ruttoo at 7 A. M. and ascended Chakoong by a very steep path, reached the summit at 8 A. M., a rapid descent and ascent over several small spurs, brought us at 11 A. M. to the Rumnam river, which we crossed by a very good cane-bridge.

Upon the southern flank of Chakoong I saw several large blocks of sandstone, black clay slate and gneiss. The jungle was too dense to allow of any examination of the ground. In the Rumnam, gneiss veined with white quartz is the only rock to be seen.

At 1 P. M. we reached the guard-house at Goke by an excellent government road which commences at the Rumnam river; four sets of zig-zags and many easy gradients, render the road accessible to horses. The change from steep and narrow footpaths, to a broad road was most delightful. There is much cultivation upon the spur and many substantial Limboo houses. The most remarkable feature upon the Goke spur is the large bamboo forest through which the road has been cut; bamboos ten inches in diameter and a hundred feet in length may be had in any quantities. These bamboos, called by the natives “Choongas,” are used at Darjeeling, instead of the common leather-bag (mussak), for holding water for domestic purposes; they are also used as milk-pails, also for holding chee, ghee and other liquids. Amongst these bamboos, I saw the large black squirrel, measuring about three feet six inches from the nose to the tip of the tail. From Goke half an hour’s descent brought us to the little Rungeet where our friends had sent us ponies and some bread; a man having been sent on two days ahead to announce our approach; at 4.30 P. M. we reached Darjeeling by the Tuqvor spur, having been away eighteen days, during which we had travelled 360 miles on foot or at the rate of twenty miles per diem ascending 36,000 feet and descending 31,000 feet, to reach an elevation of 14,500 feet distant in a direct line thirty-seven miles from the point of departure. These figures may in a slight measure convey some idea of the labour that has to be undergone by a traveller in the Himalayahs. The longest march made during the trip *in a direct line* was ten miles; the average distance was only five miles, each march occupying eight hours steady walking.

Here I part with my Lepcha guide and Lepcha companions, testi-

lying at the same time to the good nature and good temper of these interesting people, whom no hardship or discomfort appears to ruffle. After travelling for nearly twenty years amongst the “*noli me tangere*” Hindus, who, fenced about with a cruel caste, refuse all approach to familiarity, sociality, or even kindness with any one, even with one of their own caste, the change to Lepcha followers for Hindus is most pleasing: on one hand there is the brooding, moody Hindu, exchanging no thought with any one; eating his food in silence and alone; his fear lest any one below him in caste should touch him; his dread lest any of the hundred omens observed between his rising up in the morning and his lying down at night should not have been properly divined and acted up to; the cruel bondage to which his every action in life is subservient, makes the unfortunate Hindu any thing but a pleasant companion: on the other hand we have the free, happy, laughing and playful, no-caste Lepcha, a child of the mountains, modest, social and joyous in disposition.

I have watched the Lepchas after a good day's work playing amongst themselves, either racing on foot, playing at hop-step and a jump, quoits, wrestling and jumping; or walking up to a companion and throwing his arm round his neck, a Lepcha will pretend to be asking some question, in the middle of the pretended conversation, his friend receives a violent kick from behind, he turns round to see who is the culprit, no one is there and his friend has disappeared screaming with laughter at the trick he has played a hundred times before; a chase takes place, they run, they double, the culprit is caught, they wrestle and end by rolling upon the sward locked in each other's arms, they rise in good humour and go off to play the same trick upon some one else. I frequently brought these pastimes to a temporary close by offering the Lepchas a plate full of rice, ham, sausages, or perhaps half a raw flitch of bacon; panting from these healthy exercises, they would take the viands, their very teeth grinning thanks, sit down on the grass and divide the mess amongst each other.

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*Notices and Descriptions of various Reptiles, new or little known.—**By E. BLYTH.*

TESTUDO PHAYREI, nobis. Great Burmese land Tortoise. Carapax smooth, as in *T. RADIATA* and *T. ANGULATA*, but much flatter; oblong, subquadrate, its free marginal plates reverted and moderately serrate. Nuchal plate broader than long. Caudal plate *double*. Gular plates longer than broad, moderately notched: anal broader than long, and deeply notched. Beak unemarginate. Fore-limbs covered with very long and thick imbricated scales, much as in a Pangolin; the claws elongate, strong and thick: similar great elongate scales at the heel; and a group of five principal obtuse spines on either side of the tail, the medial of them remarkably strong and thick. Two or more smaller spines or thick elongate scales above the tail. Colour wholly black, or mingled more or less with buff-yellow. In the young, the scales are probably of the latter hue, with gradually increasing black centres. Limbs deep brown; some of the claws yellow in some specimens: the head and neck paler brown, strongly tinged with yellow. Our largest specimen is 20 in. long in a straight line, or  $22\frac{1}{2}$  in. measured over the curve of the carapax, from front of nuchal plate to middle of caudal notch: greatest breadth  $14\frac{1}{2}$  in. or  $20\frac{1}{2}$  in. following the curve, from one obtuse lateral angle to the other. Height  $1\frac{1}{4}$  in. Head to occiput  $4\frac{1}{2}$  in. The shell of this individual is wholly black, with merely a few slight indications of the ochreous-yellow colouring: all the claws deep brown. Another, rather smaller, has the appearance of great age, with most of the plates of its carapax more or less completely united, so that the form of some cannot be traced. Colour irregularly mingled black and dull buff-yellow; the plastron chiefly black; and several of the claws are yellow wholly or in part. Hab. Arakan; Tenasserim Provinces. Specimens presented by Capt. Phayre.

*T. ELONGATA*, nobis. Small Burmese land Tortoise. Carapax elongate, becoming more so and quite smooth in adults, wherein it approaches to a semi-cylindrical form; flattish, sub-even, the three medial vertebral plates lying almost in a plane, and the free marginals

slightly reverted. Caudal broader than the last vertebral. Nuchal twice or thrice as long as broad, and even with the borders of the anterior marginals. Gulars not notched, or but very slightly so. Caudals divergent from base, and transversely elongate-triangular, broader than long, forming a slight lateral notch with the ventrals. Beak laterally notched or distinctly three-pointed. Scales of the limbs rather small, contrasting much with those of the preceding species. Colour of half grown specimen orange-yellow, each plate having a large black centre, which mostly disappears with age, leaving a few more or less radiating black spots on those of the carapax, and often a black spot on only the large medial plates of the plastron. Head and limbs brown, much tinged with yellow. Length of an adult 13 in. in a straight line, by 8 in. across, or rather more towards the hinder part of the body. Height  $5\frac{1}{4}$  in. Head to occiput  $2\frac{3}{4}$  in. Hab. Arakan. Specimens presented by Capt. Phayre. According to Dr. Helfer, Tortoises abound in the Tenasserim Provinces, and are much eaten by the Peguers and Karens, who train dogs to search for them.

In India proper and also in Ceylon, only one species of land Tortoise occurs, the *T. STELLATA*, Schweigger, a figure and interesting notice of which are given by Capt. Hutton in *J. A. S.* VI, 689, under the supposition of its being *T. GEOMETRICA*. The latter is a S. African species, very similar to *T. STELLATA*, but having a distinct nuchal plate, which *T. STELLATA* does not possess, and exhibiting certain other distinctions. Among some Tortoises, however, presented to the Society by Capt. Sherwill from S. Africa, are two small specimens of *GEOMETRICA*, and one full grown example which can in no way be distinguished from the Indian *STELLATA*. The latter does not inhabit Lower Bengal, and is rarely brought alive to Calcutta. One much more commonly brought here is the *T. RADIATA*, Shaw, a larger species remarkable for its very hemispherical form, and which is said to be indigenous to Madagascar, in which case it is probably brought to India from the Mauritius. The very large specimen referred by me to *STELLATA* (v. *actinodes*) in a note to p. 462 *ante*, I now think, after much consideration, to be distinct, and shall indicate as

*T. MEGALOPUS*, nobis, *n. s.* Similar to *T. STELLATA*, but attaining



a much greater size, with proportionally much larger feet and claws. The colours duller and therefore less strongly contrasting, and the lines radiating from each boss of the carapax more numerous. Fore-feet with two large claw-like scales of equal size behind the palm, and no others approaching them in size. Claws of hind-feet fully twice as large as in adult *STELLATA*. Length of carapax, measured in a straight line, 12 in., by  $7\frac{1}{2}$  in. in diameter-breadth. Hab.——?

There are several living specimens about Calcutta, of the great Seychelle Tortoise, miscalled *T. INDICA* by Gmelin, and under which Mr. Gray unites no fewer than seven of the supposed species admitted by M. M. Dumeril and Bibron. According to Dr. Schlegel, "The Indian Tortoise [so-called], probably indigenous to Madagascar and the neighbouring isles, has been acclimated in the Gallapagos Isles, in California, and on several other points on the western coast of South America:" but we have been assured, on good authority, that numerous specimens kept in gardens in the Mauritius, have all been brought from the Seychelle Islands in the first instance, that they are still commonly brought from those islands to the Mauritius, and thence we believe the few in India have been imported. It is most assuredly not an Indian reptile, nor have we heard of its ever propagating in this country.\*

\* In the Mauritius I am informed that it is eaten. The largest I have seen is in my own possession, alive, and measures 4 ft. 4 in. in length over the curve of the carapax, or 3 ft. 5 in. in a straight line; transversely 4 ft. 2 in. over the high arch of the carapax, or in a diameter line 2 ft. 2 in.: height, when not raised upon the legs, *i. e.* height of shell,  $20\frac{1}{2}$  in.; when walking, the shell is lifted fully 6 in. from the ground, if not more: circumference of hind-foot  $17\frac{1}{2}$  in. A scientific friend, recently from Jamaica, assures me, that this great Seychelle species is quite distinct from the great Gallapagos Tortoise, which has bred and multiplied in Jamaica and other W. India islands. Curious, that these gigantic land Tortoises (diminutive, however, in comparison with the extinct Indian *COLOSSICHEILIS*), should thus be indigenous to small oceanic groups of islands, in each case remarkable for the peculiarities of both their *fauna* and *flora*. We are reminded of the great wingless birds (*Dodos* and *Solitaires*) of the Mauritius, Bourbon, and Rodrigues; those also of N. Zealand and of Madagascar; the *MEGAPODIUS* of the Nicobars, and its congeners of other islands; the singular and quite recently extinct great Parrot of Philip Islet near Norfolk island, with its sole congener in N. Zealand; the Owl-like

From Afghanistan Mr. Gray describes a *T. HORSFIELDI*, which he suggests may be *T. IBERIA*, Pallas, *Faun. Casp.*, t. 5. The Society's Museum possesses a land Tortoise from that country, which however belongs to the genus *HOMOPUS*, having but four claws to each foot. It may be thus described.

*HOMOPUS BURNESII*, nobis. Carapax squarish, depressed, broadest posteriorly, where the free marginals are a little reverted and distinctly serrate. Anterior border straight, the nuchal plate well developed. Caudal as broad as the last vertebral, and broader than the other vertebral plates. Nucleus of each lateral or discoidal plate near its inner or upper border. Gular plates longer than broad, the two forming a nearly equilateral triangle. Anals oblong, divergent, forming a rather deeply notched border. Scales of forelimbs rather large, and those to the front mostly uniform in size. Claws elongate, or not worn down by attrition. Beak three-pointed. Colour yellow above, with black nuclei to the plates: those of the plastron black with yellow border. The head and limbs appear to have been yellowish. Length of carapax 6 in., by  $5\frac{1}{4}$  in., measuring straight. Height  $2\frac{2}{3}$  in. Head to occiput  $1\frac{1}{2}$  in. This large specimen was procured in Afghanistan by Sir A. Burnes. A very small *HOMOPUS* in spirit, also from Afghanistan, is doubtless the young, though exhibiting some remarkable differences in the shape of the upper plates. In this the nuchal is roundish, or as broad as long;

nocturnal Cock too of N. Zealand, also close upon extirpation, &c. The majority, if not all, of these islands appearing to be remnants of what may be comparatively termed continents, each with its peculiar centre or centres of creation.

In all these supposed reliques of ancient lands, with the chief exception of Madagascar, mammalia are rare, and are chiefly or wholly *Cheiroptera*, *Rodentia*, and *Marsupialia*; the two former orders comprising the only placeatal mammalia of Australia; and one species of each of these placeatal orders being the only known indigenous mammals of N. Zealand, though a large Badger-like animal has lately been reported in the latter country, in all probability a marsupial. Madagascar is very remarkable for the extraordinary development of the quadrumanous group of Lemurs, among the higher placeatal mammalia; and has even a rodent Lemur in *CHEIROMYS*, as Australia has a rodent marsupial in *PHASCALOMYS*. Its other placeatal mammals are mostly of peculiar genera, unknown even on the neighbouring continent of Africa; and no marsupial has been discovered there.

and all the vertebrals are about equally broad. Colour dull yellow throughout. Presented to the museum by Dr. Allan Webb.

Of the numerous true Terrapins (EMYS) of the Gangetic rivers, only three species are common in the vicinity of Calcutta; and adults of all are rarely met with. These are—*E. THURGHII*, Gray, which attains to a much larger size than has hitherto been described, adults measuring 20 to 22 in. (straight) in length of carapax; *E. TECTUM*, Gray, the adults of which measure similarly 6 in.; and *E. HAMILTONII*, Gray, the adults of which measure similarly  $5\frac{1}{2}$  in. The only other species we have yet met with from this vicinity is *E. TENTORIA*, Gray, one young specimen only. This Mr. Gray describes from the Bombay Dukhun, where procured by Col. Sykes; and Sir Alexander Burnes obtained an adult from the Indus, which is now in the Society's museum. These two specimens differ in some respects from each other, also from Mr. Gray's description, and from Buchanan Hamilton's coloured figure, the two latter again presenting certain discrepancies one from the other. The species is nearly affined to *E. TECTUM*, Bell, but at all ages has the median keels to the first three vertebral plates much less developed, and the form of the whole carapax is conspicuously flatter and broader. A peculiarity of both species consists in the peculiar decanter-shaped form of the fourth vertebral plate. Comparing the adult of *E. TENTORIA* from the Indus (length of carapax, measured straight,  $6\frac{3}{4}$  in.) with an adult of *E. TECTUM* from the Hughly (carapax, similarly measured, 6 in.), the first vertebral plate is proportionally much broader in the former, pentagonal, narrower to the front, with a broad straight transverse base posteriorly, and the keel little developed; whereas the first vertebral plate of *E. TECTUM* is pentagonal, broader to the front, with a rounded posterior base, and much more developed keel. In the former, the first vertebral is considerably larger and somewhat broader than the second, whereas in the latter it is sub-equal or even rather smaller than the second: in adult *E. TENTORIA* the second vertebral plate is hexagonal but almost square, and rather broader than long, with the keel nearly obsolete; in *E. TECTUM* somewhat pear-shaped, truncate to the front and narrowing and curving off posteriorly, with the keel strongly marked: the third vertebral plate of adult *TENTORIA* is quadrangular, longer by

half than broad, with the keel quite obsolete on the anterior half, and flat and but little raised posteriorly; in *E. TECTUM* it is hexagonal, with the keel strongly developed and prolonged backward. A narrow black line is continued along the spinal ridge of *E. TENTORIA*; whereas the middle of the ridge is broadly white in *E. TECTUM*, bordered by a black line on either side. The plastron of *E. TENTORIA* is blackish-brown, with a pale border to each plate; in *E. TECTUM* pale with two or three distinct blackish patches on each plate. Comparing the young of the two species, the first vertebral plate forms a much broader pentagon in *E. TENTORIA*, being equal in breadth to the second; in young *E. TECTUM* the first vertebral plate is considerably narrower than the second: the second vertebral plate in young *TENTORIA* forms a heptagon with the base posteriorly; in young *TECTUM* a pentagon with rounded apex and anterior base: the third in young *TENTORIA* is subquadrilateral, somewhat longer than broad, with the keel a little produced posteriorly; in young *TECTUM* a pentagon with its base to the front, and the keel much broader and more prominent. Yet, notwithstanding these great differences of detail, and also of the colouring of the head, neck and limbs, the two species are very liable to be confounded on a superficial glance.

According to M. M. Dumeril and Bibron, the *E. TRIJUGA*, Schweigger, was obtained by M. Duvaucel from the "salt-water lake" lying east of Calcutta; but of the numbers of *Terrapins* which we have seen from that locality, we have sought in vain for this species, which belongs to the peninsula of India, and is the only one which has been there observed, with the exception of Col. Sykes's specimen of *E. TENTORIA*.\* In Ceylon it is replaced by the very distinct *E. SEBÆ*, Gray.

On the Arakan coast, adults of *E. DHONGOKA*, Gray, approaching to 2 ft. in length of carapax, would appear to be very common; but the only young specimen which we have seen of this species was sent down alive from Asám by Major Jenkins, and is now

\* Since the above was printed, we have obtained another *EMYS* from the vicinity of Chaibasa, which appears to be the young of *E. DHONGOKA*; and Mr. Jerdon assures me that a large species abounds in the Nerbudda, 2 feet and upwards, which is probably the same: it is not referred to in Mr. Jerdon's paper, p. 463 *ante*.



mounted in our museum. The adults have much the appearance of *TETRAONYX LESSONII*, D. and B., but are readily distinguished by having five instead of four claws to the fore-feet. *T. LESSONII* abounds at the mouth of the Hugly, and great numbers are brought to Calcutta, where they are eaten by particular castes of Hindus, and are even kept for sale in tanks. Though the water-Tortoises generally are much used as food, the species chiefly consumed, or at least which are brought in greatest quantity for that purpose, are *TETRAONYX LESSONII* and *EMYDA PUNCTATA*. The latter appears to be the most generally diffused species of Tortoise throughout the whole of India and Ceylon, and is very abundant in Lower Bengal, burrowing deep into the beds of tanks when the water dries up. A large one which escaped into the Society's compound was found several months afterwards in a healthy state, buried among the roots of some guinea-grass.

A small and evidently young *EMYS* from Arakan or Tenasserim would seem to be

*E. OCELLATA*, Dumeril and Bibron. The colouring agrees with the description: the details of structure less completely. Length of carapax 6 in. (measured straight). It is affined to *E. THURGHII*; and, as compared with a specimen of *E. THURGHII* of the same size, it is at once distinguished by having the whole under surface of the shell spotless yellowish-white, and each lateral or discoidal plate of the carapax is marked in the centre with a large round reddish-brown spot, surrounded by a pale areola; an interrupted black line along the spinal ridge, which is raised into keels on the first four vertebral plates. These are of equal breadth, whereas in *E. THURGHII* the first is much narrower than the others. Nuchal plate twice as long as broad, and throughout equal; whereas in *E. THURGHII* it is triangular with posterior base. Hindmost vertebral plate much narrower than in *E. THURGHII*; and the posterior marginals and especially the caudals are much smaller than in that species. Colour of the upper parts greenish olive-brown, with the ocelli before mentioned, which probably become obscured with age. Head brown above, with yellow superciliary line meeting its opposite over the nostrils, and another proceeding backward from the eye. Limbs and under parts apparently yellowish without markings.

There is a species of Chameleon in the Society's old collection, the origin of which is unknown, but it would appear to be undescribed. It would seem to be most nearly affined to *C. CUCULLATUS*, Gray, and has the occipital flaps of both that species and *CH. DELEPIS*, Leach.

*CH. VERRUCOSUS*, nobis. Body minutely tuberculated, with larger tubercles regularly interspersed throughout. The latter are smaller and contrast less strongly on the limbs and tail, and are more thickly set upon the limbs. Ridges of the back and throat serrated, the tubercles becoming smaller towards and upon the tail. Beneath, the tail is smooth, though tending to exhibit a slight serrature towards its base. Superciliary ridges not uniting together, either before or behind; and a small medial occipital ridge continued to the base of the two lateral flaps or lappets of skin. Colour of the specimen blanched; but there is a strongly marked black streak proceeding backward from the axilla, and surmounted by a white streak, the two occupying the space which may be concealed behind the humerus. Length  $11\frac{3}{4}$  in., of which the tail is 6 in. Hab. unknown.

*LEIURUS BERDMOREI*, nobis (*Geckoidæ*). Agrees with Mr. Gray's definition of *LEIURUS*, except that there is no appearance of the toes being webbed at base. Colour grey, with 4 longitudinal blackish streaks along the back and sides, 3 or 4 interrupted cross-bands of the same on the upper surface of the tail, a medial black streak on the nape, and others successively diverging on each side of it, and a black streak from before the eye continued to the shoulder. Some mottling also on the limbs. Hab. Mergui, where procured by Capt. Berdmore.

The genus *STELLIO* is new to the Indian fauna. A species from Upper Hindustan cannot be safely separated from the Arabian *ST. CYANOASTER*, Ruppell, unless upon comparison of specimens. The tail, however, appears to be longer; and there is a slight gular *fanon*. Specimens vary much in colour. An adult from Mirzapore, presented by the late Major Wroughton, measures  $12\frac{1}{2}$  in. long, of which the tail is 8 in. Throat blue, spotted over with yellowish-white, deepening to purple on the *fanon* which is less spotted. The rest of the lower parts are yellowish-white, marbled on the trans-

verse fold of the neck and immediately behind it with blackish, and spotted with the same on the breast and belly, the spots becoming less numerous on the latter. Upper parts dark olive-green, the back and sides speckled over with whitish. Two smaller specimens were presented to the Society by L. C. Stewart, Esq. now of H. M. 61st Regt., from Wuzerabad. Length of one  $8\frac{3}{4}$  in., of which the tail measures  $5\frac{1}{2}$  in. In these the under parts are yellowish-white, suffused or marbled with bluish or pale dusky on the throat, and slightly spotted with the same on the breast. Upper parts paler olive-green than in the large specimen; the back and sides speckled with yellowish-white in one, as in the adult example, with traces of dusky marbling on the back; in the other, the back is much more marbled and blotched with dusky, and has only a few largish dull white spots on the back and sides, while the limbs and tail are banded, and there are three dark transverse lines over each eye. If new, *ST. INDICUS, nobis.*

Genus *CALOTES*, Kaup. We have now nine well marked species of this genus in the museum. The first three are distinguished by a pit or fold before the shoulder, which is lined with minute scales.

1. *C. EMMA*, Gray (vide "Proceedings of the Asiatic Society" for May, 1853, p. 413.) Inhabits Mergui, and probably other parts of Burma, ranging northward perhaps to the Khásya hills; but extremely doubtful as an inhabitant of Afghanistan. We have elsewhere expressed our suspicion (*loc. cit.*) that collections made by the late Dr. Griffith in Afghanistan and in the Khásya hills had become mixed and confounded, and hence that Mr. Gray had been led to assign his *CALOTES EMMA*, *C. MARIA*, *C. MINOR*, and *SALEA HORSFIELDI* to Afghanistan, and two of the four to the Khásyas also; countries so extremely different, that it is most improbable that the same species would be found to inhabit both of them.

2. *C. MYSTACEUS*, Dumeril and Bibron. (Described *J. A. S.* XXI, 754). Inhabits Burma, and also the mountainous parts of Ceylon. Hind-toe reaching to the ear.

3. *C. ROUXI* (?), Dumeril and Bibron. Three adult specimens and another half-grown forwarded by Dr. Kelaart from Newera Elia, in Ceylon, accord fully with the description as regards structure;

but the colouring is remarkable, and different again from that of Mr. Jerdon's supposed *C. ROUXI* of S. India. Pit before the shoulder more developed than in *C. MYSTACEUS*, and partially black. Hind-toe reaching to the eye. A row of 3 or 4 raised spines above the tympanum; and nuchal crest moderate and gradually diminishing to the tail. The latter is tumid at base, and soon attenuates rather suddenly, the tumid portion exhibiting a median ridge of very broad keeled scales. Caudal scales towards the base of tail much larger than those of the body. Throat scales very broad and flat, with a median row of narrow compressed scales imparting the appearance of a small *fanon* or dewlap. A half-grown specimen (in spirit) is blue, with the tail reddish-brown to near its base, and marked with an irregular double series of *ocelli* which are white, having a black border. A few similar *ocelli* are seen bordering the low spinal crest. There is a black mark between the eye and the ear, and another below the eye; and a tinge of ruddy on the throat, about the tympanum, and on the occipital and tympanic spines. Adults (in spirit) have the body and limbs blue, the tumid base of tail green, and the rest of the tail dull red-brown, with *ocelli* less bright than in the young. Borders of lips black, continued as a broad black band (more or less variegated with ruddy-white) to the shoulder-pit. Throat whitish tinged with ruddy and strongly contrasting, as also a white band from the tympanum continued over and passing the shoulder-pit. In some, the shoulder-pit is also posteriorly margined with a white mark; and raising the fore-leg, two or three additional white stripes are seen, oblique and successively more inclining to the horizontal. The limbs are also banded with white; but these markings are often indistinct or obsolete. Tumid base of tail bright orange underneath in some specimens. *C. ROUXI* is described from Burma; but as we possess the preceding species both from Burma and the mountains of Ceylon, it is the less improbable that the present may have the same habitat.

4. *C. GIGAS*, nobis. (Supposed *C. OPHIOMACHUS*, *J. A. S.* XI, 870). Resembles *C. VERSICOLOR*, except in being much larger, having no trace of gular *fanon*, and a double nuchal crest of spine-like scales,  $\frac{1}{2}$  in. long in the specimen under examination. Dorsal crest also proportionally more developed than in *C. VERSICOLOR*,



and terminating abruptly over base of tail. Length of head and body  $5\frac{3}{4}$  in. Of tail——? Of hind-limb  $3\frac{3}{4}$  in. Colour apparently uniform without markings, but the specimen is much blanched. Hab.——?

5. *C. VERSICOLOR*, Daudin. The most common and generally diffused species, inhabiting all India and Ceylon, from the base of the Himalaya southward, and (according to Mr. Gray) also China and Afghanistan (vide, however, remarks on *C. EMMA*). It is the only species we have in Lower Bengal, where it is excessively abundant, particularly in gardens. Sir A. Burnes sent a specimen from Sindh; and we have also one from Rangoon. In the last, however, the scales are somewhat smaller than in Indian specimens, and the two detached spines on the tympanic ridge are remarkably minute; but there is no other difference. Ceylon specimens, on the other hand, appear commonly to attain a greater size, with somewhat larger scales, the nuchal and dorsal crests and also the gular *fanon* being rather more developed (and they are then the supposed *C. ROUXI* *apud nos* of *J. A. S.* XXI, 354); but smaller and younger specimens from Ceylon are quite undistinguishable from Bengal examples; and it may even be that the latter sometimes attain the size and general development of the Ceylon reptile.\* In S. India, again, the changes of colouring (as described by Mr. Jerdon) differ from those of *C. VERSICOLOR* of Bengal, and are perhaps the same as in the Ceylon animal. Here the colours are changeable, but no yellow is ever seen; and in the months of May and June, the males chiefly are often observed with the head and anterior third of the body, inclusive also of the fore-limbs, tolerably bright red, a large black patch before the shoulder, and all the rest plain greenish-brown. They are often altogether of the latter hue without markings; or the markings come out more or less strongly. The reptile is then commonly brown, lighter or darker, with a series of transverse dusky bands, broken on either side by a longitudinal whitish band which is evanescent, appearing and disappearing and sometimes shewing very conspicuously. A dusky streak through the eye, and

\* Some *living* examples sent to me from Galle by Dr. Kelaart are quite undistinguishable from living Bengal specimens.

three others radiating below and two above it. Three or four oblique streaks on each side of the throat ; and others on the limbs. Females are smaller and darker, generally of the hue of the ground on which they lie.

6. *C. VIRIDIS*, Gray. Nuchal crest extremely slight ; and no decided spines above the tympanum, but three raised angular scales placed not on a ridge, but disposed triangularly and separated apart. In some specimens, probably the females, the latter are scarcely noticeable. There is also a row of five flattened scales from below the eye to above the tympanum. Two longest hind-toes of subequal length and reaching only to the ear. Body scales acutely pointed, especially those of the lower parts. Colours green or brown, mottled with whitish and with dark brown ; lips black. From S. India.

7. *C. OPHIOMACHUS*, (Merrem). Tympanic ridge with several short and two longer spines. Longest hind-toe reaching to front of eye. Tail extremely long, its terminal three-fourths commonly whitish. General colour green, paler below ; with some irregular white transverse bands on the body in adults. Stripe through the eye red ; and nuchal crest and throat the same in the breeding livery of the males. One Ceylon example (in spirit) is remarkable for having a longitudinal white lateral band, continued from the shoulder to the tail upon which it becomes broken and lost. Identical from S. India, Ceylon, and the Nicobar Islands.

8. *C. PLATYCEPS*, nobis, *J. A. S.* XXI, 354. Hab. Khásia hills.

9. *C. TRICARINATUS*, nobis. Founded on a young specimen of a well marked species, affined by the flat form of the head to the last, but particularly distinguished by having three low crests or keels along the nape and shoulders. An oblique row of six large triangular scales over each tympanum, but no spines (perhaps on account of youth). Longest hind-toe reaching to tip of muzzle. Colour (in spirit) blue above, white beneath. From near Darjiling, where procured by Capt. Sherwill.

*ASPRIS*, nobis, *n. g. (Scincidæ)*. Affined to *TROPIDOPHORUS*, Dumeril and Bibron, but differs much in the arrangement of the shields upon the head, and the face anterior to the eyes is compressed and narrow, with subaente muzzle. Tongue very slightly notched. Teeth extremely minute. Frontal shield elongate-pentan-

gular, attenuating much posteriorly : fronti-parietals triangular and contiguous ; parietals large, subovate ; interparietal smaller, elongate and obtusely pentangular ; superciliaries five in number, broad, the two series separated apart by the narrow hinder part of the elongated frontal shield. Scales of the back and upper part of tail rhombic, strongly carinate, the keels running in parallel ridges ; of the belly roundish, smooth. Præ-anal scales 2, large, triangular. Toes 5—5, simple, slender.

A. BERDMOREI, nobis, *n. s.* Colour dusky-brown or blackish, the throat and belly ruddy-white, with some cross-bands of the same upon the neck and body, broader and more distinct on the former, and white specks on the lips, chin, and on the under and lateral surface of the tail. Eight distinct rows of keeled scales along the back. Length of specimen  $4\frac{5}{8}$  in., of which the tail is  $2\frac{3}{8}$  in., and head  $\frac{9}{16}$  in. ; fore-limbs  $\frac{9}{16}$  in. ; hind-limbs  $\frac{13}{16}$  in. Hab. Mergui, where procured by Capt. Berdmore.

MOCOA FORMOSA, nobis, *n. s.* Length of one 7 in., of which the tail measures half. Scales hexagonal, in six dorsal series. Præ-anal scales similar to the abdominal. Form robust. Frontal shield elongate-pentagonal, broadest to the front, and rounded posteriorly. Inter-nasal and fronti-nasals lozenge-shaped, or somewhat fan-shaped, broader than long. Fronti-parietals distinct, but unsymmetrically divided. Colour olive-green, with black lateral and pale superlateral bands as usual, the former much speckled with greenish-white, and the latter shewing a series of black spots. Between the pale superlateral streaks are five narrow black lines along the nape and body, variegated with angular greenish-white spots. A few such spots appear also on the upper surface of the tail, caused by a scale variegated with black and greenish-white here and there placed. Limbs minutely pencilled with black, and spots or streaks of the same upon the head. Under-parts greenish-plumbeous throughout. This large specimen was procured at Mirzapore by the late Major Wroughton ; and others, from Wuzeerabad, presented by L. C. Stewart, Esq. now of H. M. 61st Regt., are smaller and less marked with black, which does not form continuous lines along the back, but variegated scales (black, with pale

medial portion,) are throughout scattered, and there are some black markings on the head.

*M. SIKIMMENSIS*, nobis, *n. s.* A small species, about 4 in. long, the tail varying in length in different individuals. In one the head and body measure  $1\frac{5}{8}$  in., the tail  $2\frac{3}{8}$  in.; in another the head and body measure  $1\frac{3}{4}$  in., the tail but 2 in. This difference is probably sexual, the former proportions denoting the male, and the latter the female.\* Closely affined to the preceding species, but much smaller, flatter, and more lustrous, with proportionally much more slender toes. Colour of the upper parts nacreous olive-green, with three irregular black lines or rows of specks along the back, not always very conspicuous. A broad black lateral band, becoming obsolete along the sides of the tail, is margined with a glistening pale greenish stripe above, and variegated with spots of the same along its lower half and on the outside of the limbs. Under-parts greenish-white, except the tail and below the limbs where the colour is rufous-white. Some have a few dark spots on the throat. HAB. Sikim, where procured by Capt. W. S. Sherwill.

*PLESTICODON QUADRILINEATUM*, nobis, *n. s.* Proportions of *TILIQUA*; the head small, but its plates almost exactly as in *PL. LATICEPS* of N. America. Colour blackish above, pearly white below; two dorsal greenish-white streaks, commencing at the nostrils and gradually disappearing at about the middle of the tail; these streaks being exterior of the two alternating series of medial and hexagonal dorsal scales: also a lateral pale streak from fore to hind limb, which is more or less indicated on the neck and base of tail, close upon the whitish hue of the under-parts. Length  $7\frac{1}{2}$  in., of which the tail measures  $4\frac{3}{4}$  in.; of hind-limb  $1\frac{5}{16}$  in. China (Hong Kong?). J. C. Bowring, Esq.

*EUPREPES MACULARIUS*, nobis, *n. s.* Affined to *EU. CYANOASTER*, (Lesson, v. *Eu. sechellensis*, D. & B.) Like *TILIQUA RUFESCENS*, (Shaw), but the scales of the upper-parts 5-7 carinate, and colour bronzed olive-green above, pale below; the hinder half of back and base of tail above marked with irregular reddish-brown spots, and a broad reddish-brown lateral streak continued from the ear to the middle of the tail, marked throughout with white, which tends to

\* The same variation occurs in the species of *RIOPA*, Gray.



form continuous lines posteriorly. Terminal half of tail whitish. Arms and hind-limbs speckled with white posteriorly. Length of specimen  $5\frac{1}{4}$  in., of which the tail measures  $3\frac{1}{2}$  in. HAB. Rungpore?

*LISSONOTA*, nobis, *n. g.* Form of *EUPREPES*, but more slender, covered with very smooth minute uncarinated scales. Head short, flat, subtriangular as viewed from above, broader than high, with obtusely pointed muzzle. Tympanum distinct, roundish. Lower eyelid scaly. Palatal incision slight, placed far back. Tongue scarcely notched. Teeth very minute. Frontal shield pentagonal, subtriangular, broad to the front, and elongated to an obtuse point posteriorly; the supra-orbitals nearly meeting across. Inter-nasal hexangular, somewhat fan-shaped. Fronti-nasals small. Frontiparietals two, contiguous. Inter-parietal squarish or diamond-shaped. Limbs well developed. Toes 5-5, the palms and the heels (or exterior portion of soles) granular. Infra-caudal scales larger than those of the body; and two large triangular præ-anal scales.

*L. MACULATA*,\* nobis, *n. s.* Colour (in spirit) greyish olive-green, with a double row of irregular dark spots along the nape and back, and a median line of the same along the tail. On each side a dark band is continued throughout, commencing at the nostrils; and beneath this is a narrow pale streak, then a narrow dark one, and finally a few dark spots on the sides of the throat and belly. Upper surface of the limbs variegated throughout. Lower-parts albescent-greenish. Length of specimen,—head and body  $1\frac{7}{8}$  in., and tail probably about the same, but the tip is wanting. Fore-limbs  $\frac{5}{8}$  in.; hind limbs  $1\frac{5}{8}$  in.: distance apart of fore and hind limbs 1 in. From Asám; Col. Jenkins.

*OPHIOPS JERDONI*, nobis, *n. s.* A typical species, dark bronze above, black-spotted, with two obscure broad dorsal streaks; below white throughout. Length of head and body  $1\frac{1}{2}$  in.; of tail  $2\frac{1}{4}$  in.; of hind-limb, to extremity of longest toe,  $\frac{3}{4}$  in. Femoral pores 7 or 8. Shields of head plaited longitudinally. "Procured at Mhow, in pasture land." T. C. Jerdon, Esq.†

\* This species would seem affined to *PLESTIODON SINENSIS*, Gray.

† Since Mr. Jerdon's paper on the reptiles of S. India was ready for publication. With reference to that paper, p. 468 *ante*, he desires me to state that "the only specimen of *HOMONOTA FASCIATA* was taken from the mouth of a snake, in grassy land, near Jaulnah."

SPHENOCEPHALUS, nobis, *n. g.* A *Sepsoid* form affined to SPHENOPS, Wagler, but with more slender and elongated shape, and the limbs placed more distantly apart; the anterior minute and fitting into a groove, the posterior as large as in SPHENOPS, and each having but three toes, of which the innermost and next are subequal and the outer much shorter.\* Form slender,  $\frac{2}{3}$  cylindrical, quite flat and laterally angulated beneath as far as the vent: the body and tail covered with small, smooth, lustrous, hexagonal scales, with a median row of broader scales along the under surface of the tail. Head much as in SPHENOPS, but the muzzle more pointed; the upper lip covering the mouth. Tongue broad, triangular, its cleft scarcely perceptible; the incision of the palate small. Teeth very minute. Eyes minute, with semi-transparent lower lid. No external trace of ear. Nostrils terminal, placed in the anterior margin of the nasals, contiguous to the front of each inter-nasal and the rostral; rostral equilaterally triangular; supra-nasal broad, heptangular, with apex to the front; fronti-nasals subtriangular, a little elongated; frontal obtusely subtriangular; parietal inequilaterally pentangular, with obtuse posterior base, single and as large as the frontal. A large subquadrilateral plate under the eye, and three small transversely narrow plates in front of it, and posterior to the nasal plate. A large diamond plate on centre of chin, emarginated anteriorly to admit a small roundish plate which is bordered by the anterior laterals. Tail shorter than the body, and sub-cylindrical, flattened below.

SPH. TRIDACTYLUS, nobis, *n. s.* Very pale brown, a little deeper on the upper-parts. The largest of six specimens, measures 6 in. in total length, of which the tail is 2 in., and distance apart of the fore and hind limbs  $\frac{1}{2}$  in. Length of fore-limb  $\frac{1}{8}$  in.; of hind  $\frac{9}{16}$  in. From Afghanistan. Presented by Dr. Allan Webb.

The habit of this curious reptile is indicated by its structure. It is evidently a burrower, probably into loose sandy soil, where it would work its way with its wedge-like muzzle, deriving considerable *appuis* from its hind-limbs; the minute fore-legs remaining

\* It is still more nearly affined to the Australian form RONIA of Gray, figured in the Appendix to Grey's Journal; but this has still more rudimentary limbs, the anterior merely indicated externally, and the posterior shewing but two digits.

generally close within the grooves into which they fit; the head meanwhile being raised, and the long body arched,—an attitude which most of the specimens assumed when immersed in spirit.

The following is a remarkable limbless lizard from Rangoon, obtained by purchase.

OPHISEPS, nobis, *n. g.* Form anguine, of nearly uniform bulk throughout, tapering suddenly at the extremity of the tail; no exterior trace of limbs; and the vent placed in the middle of the entire length; the body above, and tail above and below, covered with parallel ranges of quadrilateral keeled scales, the throat and belly with hexagonal smooth scales, and the tapering extremity of the tail with imbricated and rounded scales. A groove on each side from shoulder to vent. Tongue obtusely forked: no palatal teeth; but a single row of small maxillary teeth: the triangular incision of the palate large. Eyes rather small, lacertine; the lids scaly. Tympanum small. Nostrils small, lateral. Head conical, somewhat compressed in front; the cleft of the mouth extending to beyond the eye. Rostral plate small, broad, triangular; it and the nasals and anterior labials surmounted by numerous small plates and larger representatives respectively of a posterior nasal and united frontinasals. Frontal shield large, heptagonal with posterior base; and the parietal inequilaterally pentangular, with anterior base. Frontoparietals quadrangular. The streaks of the chin are sub-quadrangular and placed obliquely. Along the median ridge of the back the parallel ranges of scales alternate, but not upon the tail.

O. TESSELLATUS, nobis, *n. s.* Length of specimen  $12\frac{1}{2}$  in., of which the tail measures  $6\frac{1}{2}$  in. Colour pale dingy buff-yellow, paler below, with numerous plumbeous spots on the anterior half of the body above, composed of scales of that colour, some detached, others placed contiguously to form transverse bands more or less imperfect; all the scales being highly lustrous. There are 14 parallel ranges of them above, from lateral groove to groove, and 8 such ranges below. From Rangoon.

(To be continued.)

*Notes on the Ruins at Mahábálipuram on the Coromandel Coast.—**By C. GUBBINS, Esq. B. C. S.*

The temples of Mahábálipoor or Mavellipuram are situated in Lat.  $12^{\circ} 36' 57''$  North, and Long.  $80^{\circ} 14' 1''$  East; nearly thirty-five miles south of Madras, and about five north of the little town of Sadras.

They are built and excavated from a low rocky ridge, that rising isolated from the plain, runs slanting towards the shore for about a mile and a half. The highest part, towards the north, is little more than 120 feet in elevation; and perhaps a mile from the sea, into which the southern extremity runs. It appears to have some small spurs, which may be seen cropping out at various points on the beach.

It is chiefly\* of a binary granite, that conveys to a casual observer, the idea of having been recently half-wetted by a driving pelt of rain; and although extremely hard, splits readily into masses of various, but considerable size. I saw a block from forty to fifty feet in length, and twenty-five to thirty feet in width, that had been divided with an apparently† plane surface by a single blast of gun-powder. The hewers of the caves, however, do not seem to have enjoyed the assistance of this powerful agent: their method was to trace out on the surface of the rock, the line in which they required a separation, along which small holes were made with the chisel, and wedges introduced with sufficient force to compel cleavage. It would however be difficult at the present day, to determine whether these wedges were of wood, well dried before insertion, and subsequently swelled by the application of water; or of metal driven in by repeated blows, as appears to have been the custom in ancient Egypt.

The rock yields to the weather by conchoidal peelings, which gives to the group the general appearance of a mass of gigantic boulders, or a confused assemblage of ruined domes. Considering its hard-

\* As far as I could perceive, it was entirely so: but I had not leisure for an examination sufficiently minute, to authorize my speaking positively.

† I say "apparently," because with reference to the known conchoidal fracture of the rock, it is probable that when closely examined, the surface would be found somewhat curved.



ness, it seems to be peculiarly affected by the sea air. This was remarked by Mr. Chambers in 1772 and 1776. "All these figures are doubtless much less distinct, than they were at first; for on comparing these, and the rest of the sculptures that are exposed to the sea air, with others at the same place whose situation has afforded them protection from it, the difference is striking; the former being every where much defaced, while the others are fresh, as if recently finished;" and it is necessary to bear in mind this characteristic, when discussing the antiquity either positive or comparative, of any portion of these edifices.

The greater part of these temples are excavations, after the fashion of Ellora and Elephanta; superior in taste and symmetry, though far inferior in dimensions, to the first named. The most perfect and beautiful is in a narrow ravine, towards the northern part of the range, and facing to the West; whereby it has been well protected from the effects of the sea air. Although small in its dimensions, it is remarkable for its artistic merit: the columns in particular are slender and most graceful; the pedestals couchant tigers facing outwards; the capitals elegant and well proportioned, though fashioned in a style unknown among the orders of Grecian architecture. Mr. Chambers remarks on its sculpture that "the figures of idols in high relief on its walls are very well finished, and perfectly fresh." Another appears to have been dedicated to Siva, who is represented, in the middle compartment, of large stature and with four arms. A small figure of Brahmá is on his right; Siva with his consort Párvatí on the left; and his left foot rests on a bull couchant. At one end of the temple, is a gigantic figure of Vishnoo sleeping on a Cobra-di-capello, with several heads so disposed as to form a canopy above the god. At the opposite end appears Sivání, in the character of Doorga, with eight arms, mounted on a lion; opposed to her is a gigantic figure with a human body and buffalo's head, much resembling that which is elsewhere called the Yum rájá; between them is a human figure suspended head downwards, apparently the object of their dispute: and the monster brandishes a club, while the goddess is armed with various weapons and accompanied by some dwarf attendants.

Mr. Goldingham remarks, "The figure and action of the goddess

are executed in a spirited and masterly style:" and Lieut. Newbold observes that "the best executed figure of the king of the beasts, is that on which the goddess Doorga is seen, mounted in the sculptured cave near the summit of the hill."

Not far off, a large polished slab about ten feet in length, with the figure of a couchant lion at the southern end, is shown as the bed of the Dharma rájá: which may probably be understood as the "Sit de justice," or throne, whence some prince of that name was wont to dispense justice to his people.

Of the other caves some were considerably larger, and had more the appearance of being dedicated to Vishnoo: all facing the EAST. But the striking point in which the whole series resembles that of Ellora is their unfinished state. Mr. James Fergusson remarks of them in a paper read to the R. A. Society in 1843.

"One of the most singular characteristics of this series of caves is, that they are all of one age, and probably the work of one prince, who has carried on the works simultaneously: but from some cause or other has been unable to complete even one of them. Had one been finished, or had there been any gradation of style or workmanship, some chronological arrangement might easily have been effected: but nothing of the kind exists."

Another still more remarkable point of similarity is the repetition of the sculptured group, representing a skeleton figure in a suppliant attitude before a personage appearing to possess authority. Mr. Goldingham describes the group at Mahábálipoor as follows:

"Near this structure, the surface of the rock about ninety feet in extent, and thirty in height, is covered with figures in bas relief. A gigantic figure of the god Khrishna is the most conspicuous; with his favourite Arjoon, in the Hindoo attitude of prayer; but so devoid of flesh, as to present more the appearance of a skeleton than of a living person; below is a venerable figure said to be the father of Arjoon; both figures proving the sculptor possessed no inconsiderable skill."

It does not appear whether Mr. Goldingham had any authority for this interpretation, beyond that of the attendant Brahmins, who are always ready to affix the names of some Hindoo god or hero to every ancient sculpture: but I could not perceive in the standing

figure, the usual attributes of Khrishna; neither can I recal any tale or legend, that represents Arjoon and his father Pandu as suppliants to that divinity, in a state of starvation.

When I visited the caves of Ellora in 1841, Lieut. Howarth, then engaged in making drawings of the bas-reliefs, informed me that the group was generally considered to pourtray a miser, holding a bag of money, while his wife and son, reduced to skeletons, are vainly supplicating for food; but on minute inspection, I was not satisfied with this interpretation, and find my notes on the subject as follows.

What is assumed to be a purse tied round the waist of the miser, has not the appearance of a sack containing money; but might rather represent a girdle, drawn tight round the body to ease the sensation of hunger, as is the custom with most semi-civilised nations: neither can it be a bag of coins that he holds in his hand, because the thick part is above the hand, and terminates in a point at top; but it *might* be an instrument for cutting the rock, which he is holding out to the half-starved figures at his feet. The little fat cherub may as well be supposed to be bringing him a bag of treasure, as to be taking it away; and then the entire group may be imagined to pourtray the cause and mode of construction of these caves, as a work undertaken by some prince or wealthy chief, during a time of famine, to relieve the wants of his starving people. Admitting this supposition, we shall have no difficulty in accounting for a continuation of the bas-relief which appears appended, not only to this group, but also to a similar one in less perfect preservation in another cave: and we shall recognize Ganesh, at the head of a row of females, each carrying a child in her arms, as exhibiting the eventual results of the judicious disbursement.

This interpretation is merely a conjecture; but it seems to derive great support from the existence of the same group on the rocks of Mahábálipuram. We can hardly imagine sculptors at such very different parts of India, happening to invent precisely the same story: though it might easily occur that both had to relate to posterity the same events. It is no very great stretch of credulity, to suppose that in both places, the works were undertaken by some prince, to employ his famishing subjects during a time of great scarcity; and to furnish them with food without supporting them

in slothful idleness. This is exactly what was done by Sir Charles Metcalfe, in our Upper Provinces during the famine of 1837-8, and it does not seem impossible that similar events might suggest similar remedies, to beneficent and intelligent minds, even at an interval of many centuries. Nor are we without some indications that such actually *has* been the case: for Mr. Taylor, quoting from the Mackenzie papers, says:

“It is said that in the Kali Yuga, Singhama Nada, a Zemindar of the Vellugotivara race, ruled at Mallapoor (Mavellipuram); in that time, during a famine, many artificers resorted hither, and wrought on the mountain a variety of works during three years.”

This theory will explain how in both cases, (Ellora and Mahábálipuram,) a number of works were commenced simultaneously, in order to employ at once a large number of workmen: and how they came to be left unfinished; the people naturally returning to their ordinary occupations, when the pressure of famine was removed.

I must not omit to mention another tradition, which attributes the construction of these works to a body of Northern artificers, who fled from the tyranny of their own or some conquering prince, and were suddenly recalled to their homes, by proffered favours and concessions on his part; nor the conjecture of Mr. James Fergusson, who, discrediting this story, accepts Singhama Nayadu as the prince to whom the excavations are due: and tracing him to his death in battle, while besieging the fort of Jalli Palli in the thirteenth century, conceives this event to be a more probable cause of the sudden interruption of the works, “as they were not part of the religion of the people, nor was it likely that his successor would continue the follies of his parent.” Either of these suppositions would certainly account for the non-completion of the works at Mahábálipoor: but we should then have to seek out some analogous cause for the same circumstance at Ellora: and the remarkable repetition of the significant group of sculpture would remain totally unexplained.

There are a variety of other sculptures both of beasts and human beings; and often presenting a mixture of both. The most conspicuous is the king snake, with the head and body of a man, terminating in extensive serpentine convolutions, often winding round other groups. They are nearly all on the eastern face of the rock: and



mostly close to the principal caves, which are in the northern half of the range. In the same vicinity is a somewhat remarkable monolith; a mass of living rock left isolated, and artificially fashioned outside, as well as inside. It appears to be above twenty-five feet in height, the same in length and about half in breadth. It has a long roof curved like a Gothic pointed arch, and gabled at each end. The walls are of great thickness, so that the interior cell is small: it contains a lingam, and among the sculptures on its walls, appears the figure of Ganesh in small dimensions. Its door faces the West: and close to it the Brahmins are quarrying the rock, to repair and beautify the interior of the brick pagoda; the only one in which the ceremonials of worship are performed, at the present day.

At the extreme south of the ridge, and separated from it by a small level space, along which runs the lower road from Madras to Cuddalore, stand a group of monoliths, seven in number, surrounded by a grove of cocoanut trees.\* Five of them are pagodas; of which the most southern (measured by Mr. Goldingham forty feet in height) resembles in general outline a Mussulman mausoleum. Another twenty-five feet in height, and perhaps fifty in length, has a long Gothic roof as previously described, and is ornamented on the outside: the other three are more like modern pagodas. The two remaining rocks are fashioned to imitate an elephant and a lion, in colossal proportions. All these monoliths, though close to the sea beach, and perfectly exposed, are comparatively fresh in their outline, and exhibit very little signs of corrosion. They are composed of this same binary granite, and I think we may thence conclude their comparative antiquity not to be very great.

There still remain two† temples, differing from the former in being *built*, instead of hewn in the solid rock. The first, already alluded to, stands near the village on the level ground not far from the principal caves, and is of brick, plastered and coloured in the modern style. It is of considerable size, and is still used for purposes of worship, and for the accommodation of Hindu travellers. The brahmins enjoy some revenues attached to the building, and are busily engaged ornamenting and improving it: all which circum-

\* Or else—palmyras: my recollection on this point is indistinct.

† I have been told of a third farther north, but did not see it.

stances,\* combined with its perfectly recent form and appearance, are conclusive in my mind against any claims to great antiquity that may be advanced on its behalf.

The last remaining is that which has attracted most attention from travellers: it is built of large masses of hewn granite, on one of the granite rocks already mentioned, as protruding at intervals along the sea shore. It is nearly opposite the highest part of the ridge, and has apparently been built *en rapport* with some part of the excavated hill, from which it is a mile distant in an easterly direction. Its dimensions are small: speaking from memory, I should say, under thirty feet square: but its curiously ornamented conical roof rises to an elevation of nearly fifty feet: It is surrounded on three sides, by a granite screen of ten or twelve feet high, and about five feet distant from the body of the temple: on the fourth side (the WEST,) stands a miniature of the temple, opening towards the WEST, and bearing every appearance of having originally been its principal† entrance. The walls and roof of a connecting passage still exist, but all access by this route is now barred, by a slab of black basaltic rock, fixed in the eastern wall of the portico, opposite its entrance. A similar, rather larger slab occupies a corresponding place on the inner surface of the western wall of‡ the temple; and on both are images of Siva, Parvatee and their child. I was unable to discover whether the space intervening between these two slabs is vacant, or has been filled up with masonry: but it is my very strong impression, that they and their immediately surrounding blocks of stone are long subsequent in date to the rest of the building, and have been inserted in order to mark the ancient entry. As matters at present stand, it is impossible to assign any reason for the existence of a blind chamber, or

\* It will generally be found that religious edifices, still possessing endowments, belong to the later phases of Hinduism: the more ancient having been lost, in the various political and religious contests.

† As is constantly seen at present to the EAST of Hindu temples.

‡ The centre is occupied by a large lingum which, from its dark colour, I conclude to be of this basaltic rock, which must have been brought from a considerable distance. The chaityas terminating the roofs of both temples and prophylum are the same. Every other part is granite.

other mass of building, between two temples of Siva placed *dos á dos* : and there are only two suppositions that will account for the erection of these two buildings, of obviously the same date, with a covered passage of connection. Either the smaller was a sanctuary, to be entered only from the larger ; as appears to have been the case in some of the Arian temples still extant in Cashmere : or else it must have been a portico, through which admission was obtained to the larger or real temple. The first hypothesis is contradicted by the existence of the western entry to the smaller edifice, which is certainly contemporaneous with its construction : and also by the fact that the stone screen, that so carefully encircles the larger building, *ceases* on arriving opposite the smaller. We are therefore thrown back upon the second ;\* which is supported not only by these circumstances, but also by the extreme simplicity of the present door to the larger temple ; a mere plain opening in the wall. I may also mention that while the smaller building (and through it, were the passage still open, the larger one only) is approached from the west with ease and on a level ; the only access to the simple opening in the eastern screen now serving as an entry is over a low, but steep and rugged rock washed by the breakers below. This rock has certainly the appearance, both here and elsewhere, of having been partly cut into rude steps, and partly perforated as if to receive some superstructure that has since disappeared. One solitary column still raises its head above the waves, and is commonly considered to have been a Stambha, to support lamps : it should however be remarked that there is no vestige of any mode of ascent, to place them ; neither of niches wherein they might be placed. The top is formed into a kind of peg, as if to receive some capping stone, and I have myself little doubt, that it is the sole relic of some terrace or arcade, once extending in this direction : I also traced out faintly, the platforms of two collateral buildings ; one on each side of that now standing : and among the *débris* of the southernmost, I discovered several images of the kneeling bull generally placed opposite a lingum, so corroded as to be only recognizable on careful

\* The idea of the original entrance having been from the West, will appear less strange, if it be remembered, that the entrance and portico of the Kylas at Ellora actually are from that quarter.

examination. A similar image, in a better state of preservation, is to be seen within the granite screen, on one side of the portico ; and on the other, in a closet or small chamber of comparatively recent construction, is a large recumbent statue of Vishnoo, with the ordinary Ses-naga below and above him.

On the shore close by, are several rudely sculptured rocks : one representing a monster with human arms and the head of an ox or buffalo, commonly called the Yam rájá. They have suffered greatly from the action of the sea air, as has also every part of the adjacent temple, except its chaityas of basalt. In this respect, there is a great difference between its appearance and that of the caves, or even of the group of monoliths placed in a situation no less exposed : and after close examination of all surrounding circumstances, I am unable to resist the conclusion, that this temple is by many degrees the most ancient of the remains at Mahábálipoor : in fact that it is one of the most ancient in India. I am aware that Mr. James Fergusson considers, "that its age does not differ materially from the rest ;" and it is with the greatest diffidence that I venture to express an opinion differing from that entertained by so competent an authority : but Mr. Fergusson was specially engaged in the examination of the rock-cut temples ; remarking the similarities and the differences existing between them and similar works in other parts of India ; so that probably he had little leisure for this structure ; to which I, on the contrary, devoted much attention. Besides, if I remember right, he decided these caves to be more modern than those of Ellora : at the same time he considered the celebrated Kylas of that place to have been copied from some earlier edifice of Southern India : and looking to the very great general similarity of style, I am certainly inclined to refer this shore temple of Mahábálipoor, to the *age* of those earlier structures, although the precise model of the Kylas may not be found here, but at Shellumbrum or Tanjore. This would give a considerable difference of date ; and the supposition is borne out by the assurances of the Brahmins who attended Mr. Goldingham, that their ancient books "contained no account of any of the structures here described, except *the stone pagoda near the sea*, and the pagodas of brick near the village." The obvious error of the last statement certainly detracts from the value



to be assigned to the former; but it should not be forgotten, that these brick pagodas were in their own possession, and in present use; so that they had a motive for assigning to *them* a fabulous degree of antiquity: while they had no such inducement for making an untrue distinction between the caves and the other remains, all equally abandoned and valueless to themselves.

But whatever the age either actual or relative of the various temples of Mahábálipoor, it seems certain, that at some distant period, the place was one of no small importance. The ground immediately inland from the shore temple has obviously been built over, to a considerable extent. The extremely well cemented foundations of ancient walls are now dug out, as required for building materials, by the inhabitants of the neighbouring village; or for the improvement of the brick pagoda. I examined a large mass of concrete, with bricks on the lower surface, and found it extremely solid, and in excellent preservation. It consisted of sharp broken fragments of the granite of the place, mixed with unburned shells: the excellent mortar in which they were embedded being probably these same sea shells burned. The bricks were of the large size usual in all old Hindu structures: but not uniform in their shape. Those I measured varied from eleven to thirteen inches in length, from seven to seven and half in breadth and were pretty regularly two inches\* thick; so well laid in the finest mortar, that five of them *in situ* barely measured eleven inches. Most of the houses in the village are built of these old bricks; but the ruins are so completely covered with a deposit of soil, and drift sand, that numerous excavations would be necessary, to afford even the vaguest idea of their extent. It is

\* I append a memorandum of the dimensions of old bricks I have collected within the limits of the Mahabharut, and an average of a much larger number of

Paneeput fort,	15 inch long	9 inch wide	$2\frac{1}{2}$ thick,	} specimens from the neighbourhood, gives $15\frac{1}{4}$ by $8\frac{3}{4}$ by $2\frac{1}{2}$ .
Burnawa ditto,	17     ,,	9     ,,	$2\frac{1}{2}$ ,,	
Hustinapoor do.	14     ,,	9     ,,	$2\frac{1}{2}$ ,,	
Average,	$15\frac{1}{3}$ ,,	9     ,,	$2\frac{1}{2}$ ,,	

It will be observed that here again the most variable dimension is the length: and the average of these north country bricks will be found to be exactly of the same *proportions* as the average of those at Mahabalipoor, the length  $15\frac{1}{4}$  and breadth 9, being pretty nearly to the length 12 and breadth  $7\frac{1}{4}$  inches as the thickness  $2\frac{1}{2}$  is to the thickness 2.

however certain, that there must have been a wealthy, and therefore in all probability a numerous, population, where dwelling-houses were built of burned bricks, cemented with lime mortar ; and where masons were sufficiently acquainted with the mysteries of their art, to use foundations of concrete, formed of the most durable materials, and on the most approved principles. It must be remembered that in classical days, the extremity of the peninsula was the entrepôt of commerce, between the east and the west. Gibbon says, "Every year about the summer solstice, a fleet of a hundred and twenty vessels sailed from Myas Hormas, a port of Egypt on the Red Sea. The coast of Malabar or the island of Ceylon was the usual term of their navigation, and it was in those markets, that the merchants from the more remote parts of Asia expected their arrival. This fleet traversed the ocean in about forty days, by the periodical assistance of the monsoons." Whence we gather that the European fleets proceeded to India, with the commencement of the S. W. monsoon ; and remained there until the beginning of the N. Easterly ; which is consonant with all we know of the habits of the seamen of antiquity. But, at that time of year, the ports of the Malabar coast would have been extremely unsafe ; besides that no large city is known to have flourished at that epoch, any where near Ceylon, with access from that quarter. It is therefore far more probable, that the laden ships, favoured by the strong southerly current along the shore, passed *by* the Malabar coast, and *by* the island of Ceylon, to find harbour on the Coromandel coast, and await the change that would take them on their return voyage. I have the authority of a commander of approved skill, and well acquainted with these seas, for saying that there are no physical features to prohibit the idea, that Mavellipoor may have been one of these ports. He answers my enquiries : "There are no reefs off the Seven Pagodas ; and the only danger in the vicinity, is a small reef nearly abreast of the collector's house at Tripalore, hence called the Tripalore reef, upon which one of the Company's vessels was wrecked some fifty years ago : but so near shore (half mile) as not to create any alarm at the present day," when its situation is perfectly ascertained. He adds, that even now ships passing along this coast generally make Sadras hills, to get into a good position for reaching more northern parts :

and that "there is no reason why the anchorage at the Seven Pagodas should not be as safe as Madras roads." Nor are there wanting indications of the place having formerly possessed far better anchorage than either Madras or Pondicherry could ever boast. Behind and south of the sculptured ridge for some distance inland, runs a salt-marsh, bearing every appearance of having once formed part of the estuary, which debouches about half-way between Sadras and the shore Pagoda. The soil is not at all like once firm ground, overflowed by the ocean, but rather the light pulpy character of silt, deposited by contending currents and streams in some nook, where their forces neutralised one another: an operation well known to be proceeding down to the present day in every quarter of the globe. A corresponding action, minor in degree because only due to rain and atmosphere, has most certainly taken place on the other side of the sculptured ridge: as is shown by the five or six feet of alluvial soil under which the ruins of the city are now buried: and we can with equal confidence assert, that foreigners were in the habit of visiting the place, as among the coins found in the vicinity, have been some of Rome, of China and other distant lands. No very great increase of depth in the estuary would (I *believe*, but I could not obtain accurate soundings) be necessary to admit vessels of the burthen then usual, and to afford them shelter equal to any on the coast. We have, therefore, I think, good reason to conclude, that in the olden days of which so few records have reached us, when the Chinese, the Phœnicians and the men of Tarsis united, as in the present day, the extreme east and west in bonds of amity by the mutual interchange of commodities, Mavellipoor or Mahábalipuram was a place of considerable commercial resort; and perhaps one of the chief ports of Southern India: very probably the Malearcha of Ptolemy. I am far from considering it equally certain that this was the capital city of the mythological hero Bali. We all know the tendency of the Brahmins to appropriate to their own sect every relic of antiquity they found in the countries over which they extended their influence: and beyond their own assertions, I do not know that we have the least evidence to the fact. "The name still surviving" will seem, to many, a strong argument: only it will not prove a sound one. The name of Mahábalipuram, "the city of the

great Bali," is only known at the present day to the Brahmins, and to Europeans who derived all their information either directly or indirectly from the Brahmins: and as there is no reason to believe that Sanscrit or Hindee was at any epoch the vernacular of that part of the country, we can hardly suppose that such a purely Sanscrit name ever was in common use thereabouts. Had the current name among the people been one that might possibly be considered a Tamul version of this significant epithet, we might certainly give some weight to the fact of such a name lingering about these remarkable antiquities: but on the contrary the common names of Mallapoor or Mavellipooram are\* said to have no such meaning; and the similarity of sound would rather favour the idea that the Brahmins finding these remains with a name firmly annexed, adapted both to their own purposes; by fixing upon that one of their fabulous heroes, to whose title the foreign word could most easily be converted. Their own books do not afford much support to their present claims. The Mahābhārata describes the city as being

गङ्गायाः दक्षिणे भागे योजनानां शतद्वयं  
पञ्चयोजनमात्रेण पूर्वाब्धेऽथैव पश्चिमे ।

"South of the Ganges 200 Yojanas, 5 Yojanas westward from the eastern sea." It must be admitted that we do not know the exact equivalent of the Indian Yojana:† but it has generally been considered between nine and twelve miles, either of which would carry us far south of Ceylon! If therefore this quotation refers to any city on the present continent of India we must greatly reduce the length of the Yojana: say to five or even four miles which would about bring us to the latitude of Mavellipuram. But we must suppose that the proportion of two hundred to five was somewhat near the truth: and this would oblige us to look for Bali's capital not on the sea-shore but twenty miles inland, where to the best of my information no vestige of a city remains. If we assume the Yojana five miles

\* I cannot speak positively nor of my own knowledge, not being sufficient of a Tamul scholar.

† A Pundit in this neighbourhood (Rohilcund) called it "four kos:" which would be from five to six English miles; as the local kos is seldom as much as one-half miles: and from a note to Chap. 22, of Fa Hian's pilgrimage it would seem that farther south the Yojana was only four miles.



instead of four, we shall certainly be able to satisfy both conditions pretty well in Combacorum, the Benares of the south, or in the ancient capital of the Pandyan kingdom, but either explanation is equally fatal to the claims of Mavellipuram.

It is true that it has been generally believed that the sea had encroached on this shore, and that many pagodas and buildings of this ancient city had been submerged even since the English settlements took place; and it may therefore be said that in all probability the site of this city was actually twenty miles from the sea in the days when the Mahábhárata was written. This idea is founded partly on the mariner's name of the Seven Pagodas, said to indicate the existence (in the early days of English intercourse with India) of seven Pagodas on the shore where now only one remains. But personal inspection at once shows the fallacy of this derivation of the name: the shore temples being far too low to be perceived at the distance that ships usually pass; more especially as they are backed by the cave-hewn ridge; and it is infinitely more probable that Mr. Chambers was correct in referring the appellation to the peculiar appearance presented by the rounded peaks of this ridge itself, especially as temples were vaguely known to exist in that neighbourhood without their situation being very accurately settled. He says, "The rock or rather hill of stone on which great part of these works are executed, is one of the principal marks for mariners as they approach the coast, and to them the place is known by the name of the Seven Pagodas: possibly because the summits of the rocks have presented them with that idea as they passed."

A far stronger evidence, however in the general opinion, was the tradition imparted by the Brahmins, and perhaps other inhabitants, to the earlier European visitors of the place. Mr. Chambers relates: "The natives of the place declared to the writer of this account, that the more aged people among them remembered to have seen the tops of several pagodas far out at sea; which being covered with copper (probably gilt) were particularly visible at sun rise, as their shining surface used *then* to reflect the sun's rays: but that now that effect was no longer produced, as the copper had become encrusted with mould and verdigris." Passing over as a minor objection that "at sun rise" the dark sides of the pagoda tops would

alone be visible from the shore, and that they would be best seen when illuminated by the *setting sun*, I would enquire, how is it possible that these slender ornaments should shine "far out" in the surf of the Coromandel coast, where not years or months, but a few hours of the stiff gales, with which it is so constantly visited, would be all-sufficient, not only to destroy the lustre of gilt copper, but to dislodge every stone between high and low water mark? It cannot be supposed that any sudden convulsion lowered the whole coast, so that all at once the waves should roll within a few feet of the top, instead of below the foundations of the Pagodas: for such a convulsion must infallibly have shaken them to pieces, as well as levelled the existing temple, whose still uninjured pinnacles clearly disprove the hypothesis: therefore the subsidence, if ever it took place, must have been extremely gradual, like those of the Swedish and parts of the Italian coast: and recollecting the numerous years, (not to say centuries) that would be required to sink the forty or fifty feet which may reasonably be assumed to have been the height of the vanished structures, I only ask, is it credible that the waves should have spared them until only their tops (still bright and glittering notwithstanding the dashing spray!!!) remained above the surface.

I am sorry to be obliged thus to demolish the beautiful romance of the "Wave-covered metropolis of Bali;" but it is not the first of the aerial castles of Indian tradition, that has faded before the fuller light of modern European investigation. Like Bishop Heber, I find it difficult to understand how this particular spot should have sunk so much, if (as other writers aver) the rest of the Coromandel coast, both north and south, has rather risen within historical times. I have already mentioned the local features leading me to conclude, that this immediate vicinity has not suffered any encroachment from the ocean, but has rather gained from, and increased in elevation above it by, alluvial deposits from the higher\* lands: and if a Brah-

\* The brick foundations I have mentioned as being five or six feet *below* the present surface of the land, are very considerably more than that amount *above* high-water mark. I have not noticed Capt. Newbolt's argument in favour of the submersion of the city: viz. that Chinese and other coins are often washed ashore in storms; because the fact is equally explicable, by the supposition that this was a port frequented by foreign ships, of which some must necessarily, in the course of years, have been wrecked and sunk in the vicinity.

min legend is required, there happens to exist one in the Mackenzie papers (v. Mr. Taylor's 3rd report, section 9, page 65,) that comes as near to my view of the formation of the salt-marsh, as these tales generally do to the natural truths they often dimly chronicle.

“In early times one Mallesudu ruled here prosperously, but having refused charity to a Brahmin, he was changed into an alligator. A Rishi named Pundarica, going to pluck a lotus flower in the tank where the alligator lay, was seized by it, but had power to drag it out. The king thus obtained release and went to Swerga. The Rishi wished to present the lotus flower to Vishnoo, but the sea barred his way, and would not retreat; so he sat down to bale the sea out! While thus occupied, an ancient Brahmin came and asked for boiled rice, offering to do the Rishi's work, while the latter should go and cook it. By taking up a single handful of water the sea retreated a whole coss, and when the Rishi returned he found the Brahmin reposing in the manner in which statues of Vishnoo are sometimes represented. He now recognised the god, and a fane was built by him over the spot.” If this tale have any real foundation, it probably indicates, that after a period of abandonment this site was re-occupied, and great increase of land discovered to have taken place, about the time when the worship of Vishnoo was introduced into the southern peninsula; which being a date tolerably ascertained, may possibly guide some future visitor in fixing the age of the various structures; especially if assisted by some translation of the inscriptions which were unfortunately quite unintelligible to me.

It will be observed that I have made the freest use of the accounts of other travellers: partly, in order to present in a general view the remarks now scattered in half a dozen volumes, and partly in order to support by the authority of others, the conclusions drawn in my own confessedly hasty visit. Had I only been as well acquainted at that time as I am now, with the writings of my predecessors, I should have investigated far more closely several points that I now perceive with regret I almost overlooked. The shore temple alone can be said, to have been thoroughly examined: and I suppose it must have been deemed less worthy of notice by former travellers: else I do

not understand how it could escape\* remark that the original entry of the building, must have been through the portico which is in rear at present. I trust what I have said may draw the attention of men better versed in Indian antiquities to the subject of the direction in which the entrance is placed in Hindu temples: as it may possibly prove characteristic of some particular sect or epoch. At the present day, all temples in these Upper Provinces (and as far as my observation goes, in the other Presidencies also) are turned towards the east: and a Brahmin at Huridwar gave me as a reason, the rising of the sun in that quarter. I remember† to have seen one exception (besides the Kylas at Ellora already mentioned;) which is on the grand trunk-road on the banks of the Burachur near Tal-danga. In a group of four temples, not differing essentially in style or architecture, and all apparently quite modern, one is turned to the west, while all the others are to the east, I could not discover that they belonged to different divinities, but there was no person near from whom I could positively ascertain that such was not the case.

Another point that strikes me as deserving attention, more particularly from Engineers and persons engaged on public works, is the very great durability of the basaltic rock as compared with the granite of the Coromandel coast. We have no reason to believe that the umbrella-shaped summits of the temples, which for want of a better term I have called *chaityas*, are otherwise than contemporaneous with the rest of the temple; and they are of course equally exposed to the spray and saline atmosphere: yet they appear perfectly fresh and uninjured, while the granite has lost the whole of its outer surface by gradual disintegration and exfoliation.

I append two sketch plans to elucidate the above descriptions of locality: but they have no pretensions to strict accuracy, being done entirely from memory, months after I visited the place.

\* I have not been able to procure the papers of Mr. Babington or of Mr. Walter Elliot on the subject: but of the four or five I have perused no one touches this point.

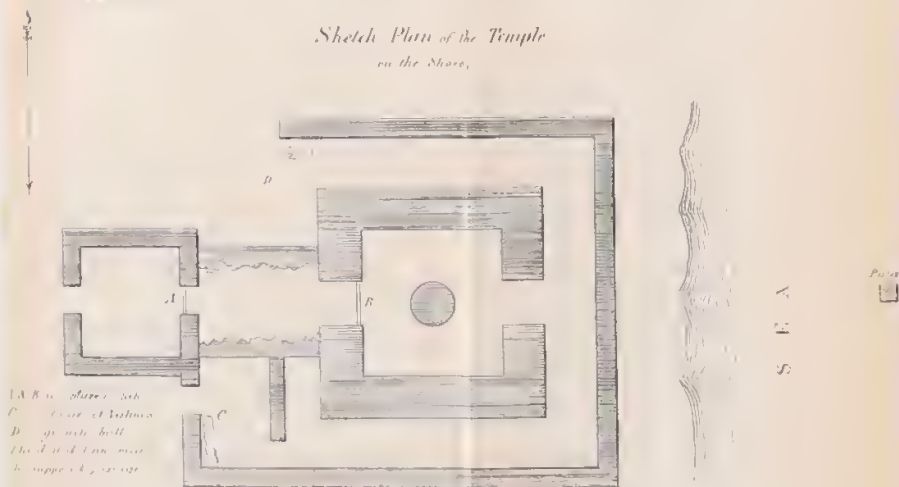
† And I think that among the Aryan temples of Cashmere, is said to be a group of four facing to all four cardinal points.



Sketch Plan  
of the country around  
MAVELLIPOOR.



Sketch Plan of the Temple  
on the Shore,







MAHĀ VALI PURAM SHORE TEMPLE.





*Note on an ancient Inscription from Tháneswar. By BÁBU RÁJENDRALÁL MITTRA, Librarian, Asiatic Society.*

Subjoined is the legend of a Sanscrita inscription lately found in the Tháneswar district. Mr. Bowring, to whom the Society is indebted for facsimiles of this interesting record, states "that it is engraved on a tablet of red sandstone in the temple of a follower of the Goraknáth persuasion, in the town of Pehewá, which is about fifteen miles west of Tháneswar." Regarding the circumstance under which it was discovered, Mr. B. adds, "I was marching from Patiala towards Tháneswar, and halted at Pehewá which is on the banks of the Saraswati river, and is a place of pilgrimage of some note, having been formerly known under the name of Prithudak. It is included in the limit of the sacred territory, known as the forty coss, that is, the distance between certain places, or the four points of the compass, within which the skirmishes of the Pándavas were carried on. The inscription was copied after my departure by the Thánádár of Pehewá, and is, as you will observe, reversed. I am not sure whether it will prove to be legible, as a part of the inscription is effaced. It is possible, however, that there may be interesting matter in it."

The document is divided into two portions, the first of which is in verse and comprises twenty-one lines, and the second is in prose and includes eight lines. They are both very imperfect, being full of lacunæ, and several letters from the beginning and end of every line effaced; the inscription, however, is of importance as throwing some light on an interesting but little known period of Indian history.

The researches of Wilford, Colebrooke and Tod have proved that three different sovereigns of central India have assumed the title of Bhoja Rájá. The first of these, according to Tod apud Prinsep, flourished about the end of the 5th century (483 A. C.) the other two in the middle of the 7th and the 10th centuries (665 and 1035 A. C.) respectively. These dates however, excepting the last, have not been proved by any authentic testimony, and the history of the three princes has been very much confounded by Orientalists. Prinsep makes the first Bhoja the nephew of Munja, while the astronomical and astrological works quoted by Colebrooke concur in

styling the latter as the uncle and predecessor of the third Bhoja, a statement fully borne out by the Jain MSS. of Col. Tod and the authorities cited by Wilford and Bentley. Colebrooke places the celebrated "nine jewels" of Vicramáditya in the court of the third Bhoja, while Prinsep, following Bentley, would have Kalidása flourish in the 5th century as a contemporary of the first king of that name.

If this imperfect inscription has been correctly read, these discrepancies are completely set at rest. It shows that the first Bhoja lived about three and a half centuries before the time assigned him by the learned historian of the Rajputs, and entirely overthrows the deductions of Bentley, regarding the age of Brahma Gupta, Vararuchi, and of some of the leading astronomical works of the Hindus, as far as they are based upon the era of the renowned sovereign of Dhára. The Bhoja of Prinsep and that of the inscription are both descended from Mahendrapála, but the former is the fourth, and the latter the tenth (if not more—for the last six lines being defaced it is impossible to be positive) in descent from that sovereign; the intervening names too are different; they stand thus:—

Prinsep (Tables p. 106.)

Inscription.

A. C.

402. Mahendrapála.

Mahendrapála.

409. Karmachandra.

Jatula.

410. Vijyananda.

————— ?

470. Munja.

Vajrata.

483. Bhoja.

Yajnika.

Sogga.

Purna.

Devarāja.

Rámachandra.

Bhoja. S. 179—A. C. 122.

Of Prithudaka, the pool, near which the inscription was engraved, nothing seems to be known, and the temple which bears its name and on which the inscription is recorded, although according to Mr. Bowring a place of pilgrimage, is not reckoned as such in the Purāṇas. But Kurukshetra itself, the battle-field of the Pándus, on which the empire of India has been more than once contested and lost, is a perfect *terra incognita* to the antiquarian, and would

prove a rich field to the tourist who with the *Mahābhārata* or the *Kurukshetra Mahatmya* by his side, could devote a fortnight to the wastes between Delhi and the Sutledge.

*Inscription.*

—शेषेषु सर्वात्मना, ध्वस्ते ध्वान्तरिपौ जने विघटिते खस्ते च तारागणे,  
 भये भूबलये गतेषु च तथा रत्नाकरेष्वेकतामङ्गे यस्स्वपिति प्र—  
 (१)—तदखिलं शार्ङ्गिणः कान्तमूर्तेः कान्तासङ्गस्फुरितसुभगस्त्रिगुण-  
 राभिरामाः। उद्यत्तीव्रस्मरजलनिधौ मज्जतः स्त्रीमुखेन्दुस्फारज्योत्स्ना-  
 श्व \* \*—(२)—बलाति दत्तं क्रियादुदयमस्तसमस्ततापम्। अध्या-  
 सितं मुनिगणैरुदितात्मबोधप्रध्वस्तगाढतिमिरप्रकटप्रमोदैः \* \*—(३)  
 —वातबद्धैः प्रलयजलधरैस्सम्पतत्सान्द्रधारः। नानाव्याधिप्रवरप्रचुर-  
 तरतमः पङ्कविध्वंसभानुनीरत्नैस्तत्समन्ताद्यनुदुरित—(४)—मृद्व्या नि-  
 न्दातः परबलन्नान्तं समन्तात्। स श्रीमाञ्जयति महेन्द्रपालदेवः शा-  
 न्तारिः शशधरसुन्दरः शरण्यः ॥ \* सीता \* \* \* \*—(५)—वृत्तशै-  
 लाशनिः। नाम्ना जातुल इत्यपूर्वचरितः ख्यातो दयालङ्कृतिस्तत्त्वा-  
 लोकिविलोकितः क्षितिपतिव्यापारलब्धोदयः। ये तज्ज्ञातिकुलं क—  
 (६)—सकले हत्वोपहारं भुवः। कीर्त्या यस्य च नाकराजनिकरव्या-  
 सङ्गतः सङ्गमाद्योन्नश्च स्फुरदिन्दुसुन्दरतया स्वस्मिंश्च लीलायितम्।  
 प्रतिविश—(७)—स्फारमारोपितानि। जगति विततभासा येन दूरं  
 विभान्ति स्वयं इव निरोद्धं शङ्खवो दिङ्निखाताः ॥ तत्सन्तानमहोदधेः  
 प्रमुदितप्रोद्यद्भुज \* \*—(८)—दः। प्रख्यातादजनि स्ववंशतिलकः  
 श्रीवच्चटाख्यः प्रभुः प्राप्ताशेषमनोरथशुभतरव्यापारतुङ्गेव्रतिः ॥ तस्य  
 स्फुरदिन्दुरुचिः सौरैरिव जय—(९)—व गिरिशस्य ॥ तस्मात्तस्यां  
 यज्ञकः प्रादुरासीदुच्चैः शान्तस्त्वसु निर्मत्सरेषु। क्रोडत्वेतुर्दुर्द्धाराति  
 चक्रे क्रुध्यत्सेनाकुञ्जरध्वान्तशोभे ॥ तस्य—(१०)—रोद्धरणोरुकीर्तेः।  
 सद्वृत्तरत्नवनितातिलकाङ्गकल्पे कान्ते बभूवतुरुदारशशाङ्गकान्ते ॥  
 एका चन्द्रेति विख्याता द्वितीया शङ्कटेति च। \* \*—(११)—जति  
 सोग्गनामधेयो वीराणां धुरि विनिवेशितो विधात्रा। भूनाथो द्विघदि-

भकुम्भभेदनिर्यन्मुक्ताभिः खचितमही \* \* \* तासिः ॥ प्रतरति—(१२)  
 —लसैनिकाम्भोरुहम् । अधर्म्मपरिप्रस्थिनं तदनु पूर्णराजं सुतं स्वव-  
 षगगनोदरे तुहिन \* \* चिन्तां \* \* । कुरुत नखरिताधरप—(१३)  
 —लैर्यदरिस्त्रियस्सरलितप्रचुरालककज्जलकाः ॥ तस्य भ्राता गुणनि-  
 धिरभूत्सोदरो देवराजः स्फूर्ज्जत्तेजःप्रविहृतपरस्फारसेनान्यकारः । \*  
 (१४)—छायस्तरुरिव ततस्सत्फलानम्यमूर्तिः ॥ नामापि प्रकटतरं नि-  
 षम्य यस्य क्रुद्धस्य भुकुटितरङ्गिताननस्य । दृप्तानां युधि विकसद्विशाद  
 भासा—(१५)—भीरुहंसरसमथितां यस्य तान्नितान्तमगमत्तृणक्षय-  
 मुप \* \* मा \* \* । व्यापूर्णं त्ववसम्भ्र\*त्यतिभटतद्वन्तिनां घटावि-  
 घटनोन्मुखी—(१६)—ररम्याभमेण प्राप्तश्रीकास्तुभतरधियस्साधुर-  
 क्तास्त्रयोपि । विप्रैस्त्रैधात्यतुलमहसं मारयामासुरत्र त्रस्तास्तीर्त्वा-  
 भवजलनिधे \* \* \*—(१७)—पुरतो देवराजेन धनानुतमगच्छिदे\*च-  
 तुस्समुद्रसीमाङ्गं यावदेतन्महीतले । इदम्भया ततं तावद्विभातुसदनं  
 श्रियः । \* \*—(१८)—नः । काम्बोजजः प्रभुमनद्धमलद्वि\*र्यो रामस्य  
 स्तनुरिह कारयिताय \* \* \* ॥ यत् कृपोपकृतामेको द्वितीयो गेज्ज-  
 मानिव । पाटलाख्यस्ततो \* \*—(१९)—सारं दृष्टोच्चैः कर्त्तव्या स-  
 दुद्धिः ॥ खकुलगगन————कार प्रसक्तः—खल्विदञ्च विदित्वा  
 भट्टरामलक्ष्मीधरेण कृतमधुरधु \* \* \* \* \*—(२०)—बभूव तन्त्र-  
 धारोत्र दुर्लभादित्यसंज्ञितः ।————लादित्येनधीमता————

परमभट्टारकमहाराजाधिराजपरमेश्वरश्रीरामचन्द्रदेवपादान्त-  
 ख्यातपरमभट्टारकमहाराजाधिराजपरमेश्वरश्रीभोजदेवपादानाम-  
 भिप्रवर्द्धमानक(१)ल्याणविजयराजधर्म्मपरमवृद्धये महाशून्यधिकवै-  
 शाखमासशुक्लपक्षसप्तम्यां संवत् २७९ वैशाखशुदि ७ अस्यां संवत्सरदि-  
 वसमासपूर्वा(२)यां तिथाविह श्रीष्टुदकाधिपा येपि स्वाधीनवत्तस्यां  
 घोटकयात्रायां समायातनटधार्म्मिकजहद्वीरकसुत चन्द्र तथा राज्य  
 बल तथा वल्लकपाण्डुकसुत सत्यसिंह उद्यति (३) कृत्यभट्टकमतमा-  
 क्षाय विलासवरेण सह तथा धिकारिमल्ल रणपरिवर्द्धक तत्तक



सुत जयनाकविल्वसुत आदित्यनाकरत्नकरवरेण सह तथा रङ्गक-  
 कर्णक (४) सुत रामकबलदेवप्रवीरश्च तत्सुत श्वेतमृगाङ्ग शरीरकर्षक-  
 सुत वर्णकवचङ्कर्षकसुत शुक्रमणीज्यसुत उपभारसार ऊडिकत्यसार-  
 सुत लाभट (५) तथा शङ्करवल्लकसुत उद्धवादित्य श्रीगुरुदत्तकृत्यवल्ल-  
 कसुत रत्नक जयवर्द्धकसुत रतिवर्द्ध \* \* \* \* क सूरसुत भ्रमदुःख-  
 घाटकीय धारदसुत चन्द्रपङ्क शैलकसुत सर्व (६) देव धर्मसुत कफ-  
 वल्लक पूर्वकण्ठवीर्या \* \* \* लल्लिकसुत स्वामिशर्कासिंहकसुत—  
 ———ओधरसुत पौण्ड्र दत्तकसुत दत्त ————क\*ल्लकसुत  
 ————(७) व\*त्य उद्भुतसुत रत्नप\*सुत सुसुभवि\*सुत भयचै-  
 तन्यधर ————हरकसुत श्रीश्रीकृष्णभक्तसुताय प्रयच्छति यथा  
 भवद्भिः

*Translation.*

Line 1. \* \* \* \* May he who sleepeth in the embrace of [Sesha],  
 when even the soul of the enemy of darkness ceaseth to be, when  
 the career of mankind knoweth no change, when the stars vanish and  
 the horizon of the earth is destroyed, when the [different] oceans  
 [which surround the globe] all merge into one [may he vouchsafe  
 prosperity to thee.]

Line 2. \* \* \* \* It is the most beneficent aspect of the god of  
 the horny-bow. Delighted in the company of his beloved, pleasing  
 as the sweet soothing stars, merged in the ocean of ardent love \* \* \*  
 radiant beams from the moonlike face of women \* \* \* \*

Line 3. \* \* \* \* May he grant such vigour as knoweth no  
 failing! Seated in the heart of sages, whose knowledge of them-  
 selves has dispelled deep darkness from their mind, who are ever  
 contented \* \* \* \*

Line 4. \* \* \* \* The cloud at the time of the destruction  
 of the earth pouring without intermission. Abounding in many a  
 dire disease; like a sun for the destruction of the soft clay \* \* \* \*

Line 5. \* \* \* \* Envied another's might. May he prosper, the  
 illustrious Mahendrapála Deva, the victorious over his enemies, the  
 beautiful as the moon, the asylum of all \* \* \* \*

Line 6. \* \* \* \* By name Játula, of excellent character, renowned and adorned with (the modest ornament of) mercy, radiant with the light of true knowledge, and glorious in kingly career  
\* \* \* \*

Line 7. \* \* \* \* The glory of his deeds made his very body brilliant as the sky, bright with the radiant moon \* \* \* \*

Line 8. \* \* \* His columns of victory in the different quarters of the earth were planted by him, as if to prevent his fame spreading wide \* \* \* \*

Line 9. \* \* \* \* The noblest of his race Lord Sri Bajrata, who had obtained all he wished, whose greatness was extreme in all auspicious actions, whose beauty was bright as the radiant moon, was born of that celebrated \* \* \* \*

Line 10. \* \* \* \* Of her was born Yajnika, the gentlest among the unenvious; his banner moves triumphant among the mighty legions of his enemies, dismal with numberless elephants \* \* \* \*

Line 11. \* \* \* \* [He] the renowned in battle had two wives, both great as if they were the crowning jewels of all well-behaved women, and beautiful as the full moon. Of them, one was called Chandrá, and the other Sankatá \* \* \* \*

Line 12. \* \* \* \* His name was Sogga; the creator of the world had placed him foremost among heroes, he was the Lord of the earth. Through the vigour of his scymetar pearls from the forehead of the elephants of his enemies had adorned this earth \* \* \* \*

Line 13. \* \* \* \* Afterwards he got a son named Purna rájá who was an enemy to vice and \* \* \* \*

Line 14. \* \* \* \* \* \* \* \* \* \* His brother Deva rája by name was the receptacle of all [noble] qualities. His vigour dispelled the clouds of his enemies \* \* \* \*

Line 15. \* \* \* Of form like a verdant tree bent down by the weight of the delicious fruit [of goodness]. The mere mention of his majestic name overcast with a frown \* \* \* \*

[Lines 16 to 21 undecipherable.]

For the promotion of the prosperity, success and the good government of the most venerable, the king of kings, Lord Sri Bhoja Deva, successor of the most venerable, the king of kings, the deceased Sri Ráma Chandra Deva, the proprietors of Sri Prithudaka, on

the 7th day of the white half of the moon, in the month of Vaisákha of the Samvat era 179, by the advice of those who had, as independent men, assembled here at the horse festival, [such as] Chandra son of Natadhármika son of Hatta Vira, Rájyabala, Ballaka, Satya Siñha son of Pánduka, and Uddyati Kritya Bhattaka, to Vilásavara, Dhikkári Malla son of the valiant Takshaka, the noble Adityanáka Ratnákara son of Jaya Náka Bilva, also Rámaka son of Rahuka Karanaka, Baladeva, and his son Právira, Sweta Mrigánka, Varana Kavachankarsaka son of Sarirakarsaka, Sukamaniya and his son Upabhárasára, and son of Lábhata Sava Hurikatyasára, and also Uddhaváditya son of Sunkara Ballaka, Rakshaka son of Sri Gurudaksha Kritya Ballaka, son of Ratibardhaka, Yaya Bardhaka, Bhramadukshaghátakiya ——— son of Sura Chandrapanka, Sarva Deva, Dharatta son of Saunaka, Kafabálhaka Dharmya's son, (after several other undecipherable names) and Sri Krishna son of Bhacta, presented \* \* \* \* \*

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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL,  
FOR NOVEMBER, 1853.

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The Society met on the 2nd instant at the usual hour.

SIR JAMES COLVILLE, Kt., President, in the Chair.

The proceedings of the last month were read and confirmed, and the accounts and vouchers for the month of September laid on the table.

Presentations were received—

1st. From the Bengal Government, through W. G. Young, Esq., Under-Secretary, for the Museum of Economic Geology. Specimens of Rocks collected by Lieut. Furlong of the 1st Madras Native Infantry, at Kaizawalajong, during a march with a detachment on the route between Padong and the Tongoop pass.

2nd. From J. A. Cockburn, Esq., Superintendent of the Barrackpore Park. A dead *Janghil Bird*. *Tantalus leucocephalus*, GM.

3rd. From J. Avdall, Esq., a new Dictionary in Italian, French, Armenian and Turkish.

4th. From R. Houstoun, Esq., a Mug MS. of medicine entitled Maha-thanada-yea.

Rájá Is'riprasád of Benares was named for ballot at the next meeting; proposed by Mr. Hall and seconded by the President.

The Council submitted a report, recommending that a grant of Co.'s Rs. 1000 (one half that amount from the Oriental Fund) be sanctioned for the purpose of four more glazed book-cases; two for the preservation of the Sanskrita MSS. transferred to the Society from the College of Fort William, and the other two for the Society's Library.

Ordered that the grant asked for by the Council, be placed at their disposal for the purpose in question.



Communications were received—

1st. From Major A. Cunningham, forwarding a plate of Kangra coins, and promising to send a descriptive account of the coins so soon as the plate shall have been engraved.

The following is an extract from Major C.'s letter.

“ I have made out this plate after examining all Bayley's coins, which have given me about five specimens in addition to those which I had before ; I have also collated all the genealogies, and I am happy to say that their general agreement with one another and, more particularly, with numerous synchronous Princes in other states, is very satisfactory. The data for establishing the Chronology are sound and good, and as they extend over a considerable period, we have the means of fixing the approximate dates of the earlier Kings.

“ The earliest ascertained date is A. D. 804, and the average length of reign from that time to the present is 1,326 years.”

2nd. From Rev. N. Brown of Sibsagur, Assam, enclosing a list of Assamese works published at the American Mission Press at Sibsagur.

3rd. From A. Campbell, Esq., Darjeeling, enclosing an abstract of the Register of rain-fall kept by Dr. Withecombe at Darjeeling, from 1st January to the 1st October, 1853.

“ The maximum fall for a whole year,” says Mr. C. “ was 135 inches in 1850, and the minimum 114 inches in 1852. I believe after a residence of many years that 125 inches may be taken as the average annual fall at Darjeeling.

“ I am not able to supply any detail of the annual rain-fall at Cheera Punjee, but from Lieut. Yule's observation (see Journal Asiatic Society) and from Dr. Hooker's letter to me from that place in 1850, I believe that the annual fall of rain there varies from 360 to 500 inches per annum.”

4th. From Capt. Thuillier, communicating a paper entitled “ Notes upon some atmospherical phenomena observed at Darjeeling, in the Himalayah Mountains, during the summer of 1852,” by Capt. W. S. Sherwill.

The Librarian and the Curator in the Zoological Department having submitted their usual monthly reports the meeting adjourned.

Read and confirmed, 7th Dec. 1853.

(Signed) J. W. COLVILLE.

## LIBRARY.

The following additions have been made to the Library since the last meeting.

*Presented.*

Archæologia: or Miscellaneous Tracts relating to antiquity. Vol. XXXV.—BY THE SOCIETY OF ANTIQUARIES OF LONDON.

Catalogue of the Kerrieh Collection of Roman Coins 1852.—BY THE SAME.

Proceedings of the Society of Antiquaries of London. Nos. 33 to 36.—BY THE SAME.

Bombay Magnetical and Meteorological Observations for 1850.—BY THE GOVERNMENT OF BOMBAY.

A Map of the District of Purneah surveyed by J. Fitzpatrick and J. J. Pemberton.—BY THE GOVERNMENT OF BENGAL.

Revenue Meteorological Statements of the North West Provinces for the several official years from 1844-45 to 49-50. Agra 1850, 4to.—BY THE GOVERNMENT OF THE NORTH WESTERN PROVINCES.

Report of the Inspector General of Prisons for 1852.—BY THE SAME.

The Satyarnab, No. 1, of Vol. IV.—BY THE REV. J. LONG.

The Oriental Baptist, No. 82.—BY THE EDITOR.

The Calcutta Christian Observer, for October 1853.—BY THE EDITORS.

The Upadeshak, No. 82.—BY THE EDITOR.

The Oriental Christian Spectator for August 1853.—BY THE EDITORS.

A Plan for the future Government of India. By J. S. Buckingham, Esq. Pamphlet —BY THE AUTHOR.

On the Cyclone Wave in the Sunderbunds. A letter to the Most Noble the Governor-General of India, by H. Piddington, Esq. Calcutta, 1853. Pamphlet.—BY THE AUTHOR.

The Citizen for September, 1853.—BY THE EDITOR.

Journal of the Indian Archipelago. Nos. for February and March.—BY THE EDITOR.

*Exchanged.*

The Calcutta Review. No. 41.

*Purchased.*

Shore on Indian Affairs, 2 vols. 8vo.

Gleig's Memoirs of Warren Hastings, 3 vols. 8vo.

Malcolm's Life of Clive, 3 vols. 8vo.

Sutherland's Dattakamimānsā.

Masson's Journey to Kelat, 1 vol. 8vo.

Siely's Wonders of Ellora, 1 vol. 8vo.

Scott's History of Dekkan, 2 vols. 4to.

Pogson's History of the Boondelas, 4to.

Burnes's Visit to Scinde, 12mo.

Wynch's Dāya Krama Saṅgraha, 4to.

## FOR DECEMBER, 1853.

At a meeting of the Society held in the Society's Rooms, Park Street, on the 7th instant, at the usual hour,

Sir JAMES COLVILLE, Kt. President, in the chair.

The minutes of the last month were read and confirmed, and the accounts and vouchers for the month of October laid on the table.

Presentations were received—

1st. From Mons. Stanislas Julian, the first volume of his *Life and Travels of Hiuean Thsang*.

2nd. From J. J. Gray, Esq. a MS. copy of the *Ryas-us Saláteen*, a History of Bengal in Persian, by Gholam Hossein.

3rd. From the Government of Bengal, for the Museum of Economic Geology, through W. G. Young, Esq. Under-Secretary, a map of the district of Tirhoot.

4th. From F. L. Beaufort, Esq. an image of Vishnu found in the bed of a Nallá in the Pubnah district.

5th. From Mons. E. Mulsant, Secretary to the *Societè Royale des Agriculture, &c. de Lyon*. *Memoirs of the Academy for 1851*.

6th. From Shah Kabeer Uddeen. The following Persian works:  
Dele Sard,  
Nálá Dard.

7th. From Captain Hayes. A collection of ancient coins from Lucknow.

8th. From H. Piddington, Esq. Clay Figures of Káluráya and Dakhinráya, forest gods of the Hindus, found on Saugor Island.

9th. From J. Ritchie, Esq. of Bombay, through Mr. Piddington, a lithographed copy of the Map of Bengal and the Sunderbund, published in De Barros's History.

Rájá Isriprásád of Benares, duly proposed and seconded at the last meeting, was balloted for and elected an ordinary member.

The following gentlemen were named for ballot at the next February meeting.

Bábu Nagendranáth Tagore,—proposed by Sir James Colville, and seconded by Dr. Sprenger.

G. H. Freeling, Esq.—proposed by Mr. E. Thomas, and seconded by Mr. Grote.

The Council gave notice that at the next anniversary meeting of the Society, they will propose that Section 6 of the Code of Bye-Laws be modified by omitting the words "is anxious to promote the progress of science and literature, and."

Dr. Falconer gave notice of his intention to propose that rule 6 be altered into the form originally proposed in the Draft Code.

Mr. Piddington sent, for exhibition at the meeting, a copy of the Admiralty Chart of the N. W. Passage, just published.

Communications were received—

1st. From W. G. Young, Esq. Under-Secretary to the Government of Bengal, stating that the Most Noble the Governor of Bengal would be glad to have any opinion or suggestion which the Society may desire to offer relative to the best way of preserving any of the ruins at Gour from further destruction.

Copy of the reply which the Council proposed to dispatch, was read and approved of.

2nd. From the same, enclosing a paper, by Capt. J. C. Haughton, on the Geological Structure and mineral resources of the country comprised within the Singbhoom division of the South-West Frontier Agency, together with a map to illustrate the same.

3rd. From Bábu Rádhánáth Sickdár, Meteorological Register kept at the Surveyor General's Office, Calcutta, for the month of October.

4th. From the Secretary, Geological Society of London, acknowledging receipt of the Journal, Nos. 230-31.

5th. From J. Barlow, Esq. Secretary, Royal Institution, London, acknowledging receipt of the Journal, Nos. 233-34.

The Librarian having submitted his usual monthly report, the meeting adjourned.

Read and confirmed, 4th January, 1854.

(Signed)

J. W. COLVILLE.

#### LIBRARY.

The following additions have been made to the Library since the November meeting.

#### *Presented.*

Literaturgeschichte der Araber. Von ihrem Beginne bis zu Ende des zwölften Jahrhunderts der Hidschret. von Hammer-Purgstall. Vierter Band.—BY THE AUTHOR.



Memoires de la Société Royale d'Agriculture, Histoire Naturelle et Arts Utiles de Lyon, 1825-1836, 5 volumes.—BY THE SOCIETY.

Compte Rendu des Travaux de la Société Royale d'Agriculture, Histoire Naturelle et Arts Utiles de Lyon, pour l'années 1813-15-17-19-21 et 24, 6 volumes.—BY THE SAME.

Annales des Sciences Physiques et Naturelles d'Agriculture et d'Industrie, publiée par la Société nationale d'Agriculture, etc., de Lyon. Tome III.—BY THE SAME.

Memoires de l'Academie Nationale des Sciences Belles-lettres et Arts de Lyon. Classe des Sciences, Tome 1er.—BY THE ACADEMY.

Ditto ditto, Classe des lettres, Tome 1er.—BY THE SAME.

Collection Orientale. Burnouf's Bhágavat, vol. III.—BY THE IMPERIAL GOVERNMENT OF FRANCE.

Lexicon Geographicum cui titulus est *مصارد الاطلاع على اسماء الامكنة والنفاع* Quintum fasciculum et sextum. Edidit T. G. J. Juynboll.—PRESENTED BY THE CURATORS OF THE ACADEMY OF LEYDEN.

Specimen e literis orientalibus, exhibens historiam Kalifátus al Walidí et Solaimáni, sumtum ex libro, cui titulus est: *كتاب العيدين والسجد* e codice Ley. nunc primum edidit Jacobus Anspach. Pamphlet.—BY THE SAME.

Memoires de la Société des Sciences Naturelles de Cherbourg, 1er. volume, 1 livraison.—BY THE SOCIETY.

Journal of the Royal Asiatic Society of Great Britain and Ireland. Vol. XV. p. 1.—BY THE SAME.

The Thirtieth Annual Report of the Royal Asiatic Society.—BY THE SAME.

Selections from the Public Correspondence of the Administration for the Affairs of the Punjab, No. 5, 4 copies.—BY THE CHIEF COMMISSIONER OF THE PUNJAB.

The History of Rájá Pratapaditya, the last king of Sagur Island, by Harishchandra Tarkalankár.—BY THE REV. J. LONG.

Selections from the Bengali Periodical Press.—BY THE SAME.

Charupátha, or Entertaining Lessons in Bengali. By Akshayakumára Datta.—BY THE AUTHOR.

Nálaé Durd—a Persian work on Devotion.—BY SHAH KUBEER-UDDEEN.

Delé Surd, ditto.—BY THE SAME.

The Missionary, vol. III. No. II.—BY THE EDITOR.

The Oriental Christian Spectator for October, 1853. BY THE EDITORS.

The Bibidharta Sangraha, No. 22.—BY THE EDITOR.

The Satyarnab for November, 1853.—BY THE REV. J. LONG.

A Map of India, chiefly compiled from Trigonometrical Surveys, executed, by order of the Hon'ble Court of Directors, by J. Walker.—BY THE GOVERNMENT OF INDIA.

*Exchanged.*

The London, Edinburgh and Dublin Phil. Magazine, No. 38.

The Athenæum for September, 1853.

*Purchased.*

The Birth of the War-God, a poem by Kalidása. Translated from the Sanskrit into English verse.—BY RALPH F. H. GRIFFITH, M. A.

Journal des Savants, July and August, 1853.

Comptes Rendus, Nos. 5 to 10, for July.

Ritter's Atlas.

Thomson's Travels in Western Himalaya and Tibet.

Michaud's Bibliotheque de Croisades.

December, 7th 1853.

RA'JENDRALA'L MITTRA.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of June, 1853.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer.			Mean Dry Bulb Thermometer.	Range of the Tem- perature.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.645	29.707	29.574	0.133	87.5	96.3	77.7	18.6
2	.600	.651	.534	.117	85.6	97.0	79.7	17.3
3	.517	.586	.436	.150	84.5	92.0	76.7	15.3
4	.457	.524	.381	.143	87.8	95.9	77.8	18.1
5	<i>Sunday.</i>							
6	.468	.545	.413	.132	86.2	94.0	79.4	14.6
7	.504	.552	.457	.095	84.0	88.0	69.0	19.0
8	.529	.597	.440	.157	84.4	93.5	75.1	18.4
9	.495	.538	.429	.109	87.0	92.0	74.9	17.1
10	.454	.536	.391	.145	89.1	93.8	81.6	12.2
11	.534	.607	.463	.144	89.0	94.1	81.7	12.4
12	<i>Sunday.</i>							
13	.637	.688	.568	.120	88.2	94.9	80.3	14.6
14	.641	.710	.562	.148	89.7	98.8	80.5	18.3
15	.682	.732	.621	.111	87.6	93.6	80.8	12.8
16	.682	.757	.596	.161	88.8	95.2	80.0	15.2
17	.601	.684	.511	.173	89.0	97.0	79.2	17.8
18	.505	.571	.425	.146	86.2	91.0	79.5	11.5
19	<i>Sunday.</i>							
20	.459	.525	.399	.126	81.8	86.3	74.9	11.4
21	.483	.528	.420	.108	82.7	87.3	78.0	9.3
22	.494	.541	.440	.101	85.6	91.5	76.8	14.7
23	.522	.579	.469	.110	86.6	92.4	79.0	13.4
24	.494	.541	.424	.117	87.1	93.0	77.0	16.0
25	.449	.511	.389	.122	85.3	93.6	79.8	13.8
26	<i>Sunday.</i>							
27	.505	.574	.438	.136	84.1	88.6	77.1	11.5
28	.481	.533	.411	.122	85.9	91.8	77.4	14.4
29	.464	.501	.413	.088	83.6	86.7	78.0	8.7
30	.480	.517	.411	.106	84.7	91.6	77.0	14.6

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of June, 1853—(Continued.)*

Date.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a cubic foot of air.	Additional weight of Va- pour required for com- plete saturation.	Mean degree of Humi- dity complete satura- tion being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	79.8	7.7	77.0	10.5	0.909	9.67	3.82	0.717
2	80.5	5.1	78.7	6.9	0.960	10.26	2.50	.804
3	81.0	3.5	79.8	4.7	0.995	10.64	1.71	.862
4	82.3	5.5	80.5	7.3	1.016	10.83	2.77	.796
5	<i>Sunday.</i>							
6	82.1	4.1	80.7	5.5	1.023	10.91	2.08	.840
7	81.2	2.8	80.2	3.8	1.009	10.79	1.38	.887
8	80.5	3.9	79.1	5.3	0.973	10.42	1.89	.846
9	83.2	3.8	82.0	5.0	1.066	11.36	1.93	.855
10	83.7	5.4	82.0	7.1	1.065	11.31	2.81	.801
11	83.4	5.6	81.5	7.5	1.051	11.13	2.95	.790
12	<i>Sunday.</i>							
13	81.6	6.6	79.3	8.9	0.979	10.40	3.36	.756
14	82.4	7.3	79.9	9.8	0.998	10.56	3.81	.735
15	82.0	5.6	80.1	7.5	1.004	10.67	2.85	.789
16	81.5	7.3	78.9	9.9	0.968	10.26	3.74	.733
17	81.1	7.9	78.3	10.7	0.948	10.05	4.03	.714
18	80.5	5.7	78.4	7.8	0.953	10.15	2.84	.781
19	<i>Sunday.</i>							
20	80.2	1.6	79.6	2.2	0.990	10.65	0.75	.934
21	79.8	2.9	78.8	3.9	0.963	10.36	1.36	.884
22	81.4	4.2	80.0	5.6	1.000	10.68	2.08	.837
23	81.2	5.4	79.3	7.3	0.980	10.44	2.70	.795
24	81.1	6.0	79.0	8.1	0.970	10.33	3.00	.775
25	81.8	3.5	80.6	4.7	1.021	10.90	1.74	.862
26	<i>Sunday.</i>							
27	81.1	3.0	80.1	4.0	1.003	10.75	1.46	.880
28	81.1	4.8	79.4	6.5	0.983	10.47	2.40	.814
29	81.0	2.6	80.1	3.5	1.005	10.75	1.28	.894
30	81.7	3.0	80.7	4.0	1.023	10.95	1.47	.882



*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of June, 1853—(Continued.)*

Date.	Max. Solar radiation.	Rain.	Prevailing direction of the Wind.	General aspect of the Sky.
1	112.8	Inc.	Calm or S. E.	Cloudless till 2 A. M. \ i or \ i till 7 A. M. scattered \ i till 8 P. M. nearly cloudless afterwards.
2	117.5	0.55	S. E.	Cloudless till 4 A. M. \ i or \ i till 7 A. M. scattered \ i with little rain till 7 P. M. cloudless afterwards.
3	116.0	0.15	E. or S. E.	Cloudless till 4 A. M. \ i or cloudy with thunder and rain till 7 P. M. cloudless afterwards. [scattered \ i afterwards.
4	124.0	..	[or S. E. S. or E. or N. N. E.	Cloudless till 5 A. M. cloudy till 8 A. M.
5	Sunday.			
6	118.7	..	S. or S. E. or calm.	Cloudless till 3 A. M. cloudy with rain and thunder afterwards.
7	....	0.18	S. or S. E. or N. E.	Overcast with occasional drizzling.
8	98.0	..	S. E. [or N. [ly the whole day.	Cloudy or overcast with occasional rain and thunder. [scattered \ i.
9	103.0	0.75	S. blowing high near-	Overcast with little rain and lightning or
10	109.0	..	S. E. or S. blowing high the whole day.	Overcast or scattered clouds.
11	105.0	..	S. or S. E. ditto.	Overcast or cloudy.
12	Sunday.			
13	115.5	..	S. or S. E.	Overcast with slight drizzling, or cloudy or scattered \ i.
14	120.0	..	S. E. or S.	Cloudy or scattered \ i or \ i. [wards.
15	113.0	..	Calm or S. S. E. or N.	Scattered \ i or \ i till 11 A. M. cloudy after-
16	121.5	..	S. E. or E.	Cloudy or scattered \ i or \ i. Little driz-
17	123.0	..	Calm or E. or S. E.	Cloudy or scattered \ i. [zling at 11 A. M.
18	109.0	..	E.	Overcast or scattered \ i till 7 P. M. \ i afterwards.
19	Sunday.	1.32		
20	....	3.12	S. E.	Cloudy, raining, or drizzling constantly.
21	....	0.48	S. or S. S. W.	Cloudy the whole day, and drizzling till 2 A. M. [between 4 and 5 A. M.
22	103.8	0.14	S. blowing high near-	Cloudy the whole day and a shower of rain
23	114.3	0.08	Ditto.	All kinds of clouds. [afterwards.
24	111.8	..	S. or S. W.	Cloudy or \ i or \ i till 8 P. M. cloudless
25	108.0	0.72	S. E.	Cloudy with occasional drizzling, or scattered \ i or \ i.
26	Sunday.			
27	104.0	0.46	S. E.	Scattered \ i or \ i till 5 A. M. scattered \ i or cloudy with occasional rain afterwards.
28	109.0	0.16	Ditto.	Cloudy. [occasional drizzling afterwards.
29	99.6	..	S. or E. or S. E.	Scattered \ i or \ i till 8 A. M. cloudy with
30	109.4	0.16	Calm or E. or S. or S. E.	Overcast till 4 P. M. scattered \ i or \ i or cloudy afterwards since rain at 2 P. M.

\ i ..... Cirri.  
 \ i ..... Cumuli.  
 — i ..... Strati.  
 \ i ..... Cirro-cumuli.

\ i ..... Cirro-strati.  
 \ i ..... Cumulo-strati.  
 \ i ..... Nímbi.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of July, 1853.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer.			Mean Dry Bulb Thermometer.	Range of the Tem- perature.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
1	29.468	29.508	29.398	0.110	84.5	89.9	77.4	12.5
2	.467	.536	.425	.111	83.6	89.2	76.4	12.8
3	<i>Sunday.</i>							
4	.523	.576	.444	.132	84.8	89.5	77.0	12.5
5	.496	.537	.426	.111	85.7	91.2	77.8	13.4
6	.500	.540	.441	.099	85.2	91.8	78.0	13.8
7	.510	.554	.463	.091	82.8	91.7	77.5	14.2
8	.487	.542	.426	.116	84.5	89.2	78.2	11 0
9	.429	.482	.358	.124	83.7	87.6	75.5	12.1
10	<i>Sunday.</i>							
11	.304	.345	.236	.109	83.9	89.4	75.0	14.4
12	.318	.412	.258	.154	82.8	86.9	77.0	9.9
13	.425	.493	.383	.110	80.7	84.0	76.1	7.9
14	.452	.510	.395	.115	83 6	91.2	75.9	15.3
15	.407	.473	.335	.138	83.5	91.0	73.2	17.8
16	.376	.463	.327	.136	82.4	86.7	..	..
17	<i>Sunday.</i>							
18	.513	.555	.448	.107	84.2	89.8	75.0	14.8
19	.459	.528	.371	.157	84.4	91.0	76.0	15.0
20	.411	.456	.359	.097	85.7	91.5	78.3	13.2
21	.416	.460	.360	.100	85.5	90.1	79.2	10.9
22	.411	.491	.343	.148	84.5	89.8	78.0	11.8
23	.531	.604	.468	.136	84.9	90.0	77.7	12.3
24	<i>Sunday.</i>							
25	.495	.536	.434	.102	86.6	90.6	80.2	10.4
26	.557	.639	.474	.165	82.3	85.5	79.0	6.5
27	.575	.624	.517	.107	83.6	88.9	75.7	13.2
28	.557	.615	.483	.132	85.6	91.2	78.6	12.6
29	.575	.640	.521	.119	85.2	90.5	77.8	12.7
30	.562	.606	.513	.093	82.6	85.0	77.7	7.3
31	<i>Sunday.</i>							

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of July, 1853—(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a cubic foot of air.	Additional weight of Vapour required for complete saturation.	Mean degree of Humidity complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	81.1	3.4	79.9	4.6	0.999	10.67	1.68	0.864
2	80.9	2.7	80.0	3.6	1.000	10.72	1.31	.891
3	<i>Sunday.</i>							
4	81.6	3.2	80.5	4.3	1.017	10.89	1.57	.874
5	81.5	4.2	80.1	5.6	1.003	10.71	2.09	.837
6	81.8	3.4	80.6	4.6	1.022	10.90	1.71	.864
7	81.0	1.8	80.4	2.4	1.014	10.90	0.85	.928
8	81.4	3.1	80.3	4.2	1.012	10.82	1.53	.876
9	81.0	2.7	80.1	3.6	1.004	10.75	1.32	.891
10	<i>Sunday.</i>							
11	81.0	2.9	80.0	3.9	1.002	10.72	1.41	.884
12	80.0	2.8	79.0	3.8	0.970	10.42	1.33	.887
13	79.4	1.3	79.0	1.7	0.969	10.46	0.58	.947
14	80.1	3.5	78.9	4.7	0.966	10.37	1.66	.862
15	79.8	3.7	78.5	5.0	0.954	10.25	1.75	.854
16	80.3	2.1	79.6	2.8	0.988	10.63	0.98	.916
17	<i>Sunday.</i>							
18	79.6	4.6	77.9	6.3	0.938	10.04	2.20	.820
19	80.5	3.9	79.1	5.3	0.973	10.42	1.89	.846
20	81.9	3.8	80.6	5.1	1.021	10.90	1.90	.852
21	81.8	3.7	80.6	4.9	1.019	10.90	1.82	.857
22	81.5	3.0	80.5	4.0	1.017	10.89	1.46	.882
23	81.6	3.3	80.5	4.4	1.016	10.89	1.60	.872
24	<i>Sunday.</i>							
25	82.6	4.0	81.3	5.3	1.042	11.13	2.01	.847
26	80.3	2.0	79.6	2.7	0.989	10.63	0.95	.918
27	80.4	3.2	79.3	4.3	0.978	10.51	1.52	.874
28	81.5	4.1	80.1	5.5	1.004	10.71	2.05	.839
29	81.0	4.2	79.5	5.7	0.987	10.53	2.08	.835
30	79.6	3.0	78.5	4.1	0.955	10.27	1.41	.879
31	<i>Sunday.</i>							

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of July, 1853—(Continued.)*

Date.	Max. Solar radiation.	Rain.	Prevailing direction of the Wind.	General aspect of the Sky.
	o	Inc.		
1	104.0	..	S. E. or E. S. E.	Cloudy with occasional drizzling. Cloudless from 9 P. M. to 11 P. M.
2	102.2	0.75	S. E. or S.	Cloudless till 1 A. M. Cloudy and occasionally raining.
3	<i>Sunday.</i>			
4	106.0	0.52	S. or S. E.	Cloudy with occasional drizzling. Cloudless from 8 P. M. to 11 P. M.
5	115.0	..	Ditto.	Cloudy with little thundering and drizzling at 1 P. M.
6	112.0	..	N. E. or S. E.	Nearly cloudy the whole day.
7	....	0.88	S.	Overcast or cloudy and constantly drizzling.
8	....	..	Ditto.	Overcast or cloudy. [rise.
9	....	0.44	S. or calm.	Overcast with constant drizzling before sun-
10	<i>Sunday.</i>	2.92		
11	....	0.24	Calm or N. E.	Overcast with occasional drizzling.
12	....	0.19	S. E.	Cloudy and also raining between 12 & 2 P. M.
13	....	1.34	N. E.	Cloudy and constantly drizzling.
14	....	..	S. E. or S. W.	Scattered \i or \i or \i till 6 P. M. over-
15	....	1.09	Calm or N. N. E. or [N.	cast with rain and drizzling afterwards.
16	....	0.46	E.	Cloudy and raining between 5 & 6 P. M.
				Cloudy with occasional drizzling also over-
				cast and raining at 5 & 10 A. M.
17	<i>Sunday.</i>			
18	....	0.36	E. or S.	Cloudy.
19	....	0.08	E. or S. S. E.	Cloudy with occasional drizzling.
20	....	..	E. or N. E. or S. E.	Cloudy or scattered \i or \i or \i.
21	....	..	E. or N. E.	Scattered \i till 5 A. M. Cloudy after-
				wards, also drizzling at 1 P. M.
22	....	..	N. N. E. or N. E.	Cloudy and also rain between 8 & 10 P. M.
23	....	0.42	S. S. E. or S.	Cloudy and constantly raining.
24	<i>Sunday.</i>			
25	....	..	S. or S. W. or S. E.	Scattered \i till 7 A. M. Cloudy afterwards.
26	....	1.47	S. E. or S. W.	Cloudy and constantly raining or drizzling.
27	....	1.49	S. E. or S. W. or	Scattered \i or cloudy with occasional
			N. W. or calm.	drizzling before sunrise also rain at 2 P. M.
28	....	..	Calm or S. W. or S.	Cloudy and also drizzling at midnight and
				3 P. M. and raining at 11 P. M.
29	....	..	Calm or S. W.	Cloudy and drizzling at 4 & 8 P. M.
30	....	0.11	S. W. or S.	Scattered \i or \i or \i till 5 A. M. Cloudy
				with occasional drizzling afterwards.
31	<i>Sunday.</i>			



2007-1878 1878 1878 1878 1878 1878



*Cervus canadensis*





*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of August, 1853.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer.			Mean Dry Bulb Thermometer.	Range of the Tem- perature.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.571	29.618	29.514	0.104	83.5	88.7	75.9	12.8
2	.591	.644	.528	.116	83.4	92.1	75.9	16.2
3	.611	.659	.557	.102	86.3	92.7	75.8	16.9
4	.611	.663	.559	.104	85.4	92.0	78.2	13.8
5	.610	.660	.546	.114	83.8	90.0	78.0	12.0
6	.574	.626	.514	.112	83.5	87.8	74.5	13.3
7	<i>Sunday.</i>							
8	.583	.640	.527	.113	81.5	83.1	77.3	5.8
9	.616	.668	.561	.107	82.9	90.0	75.9	14.1
10	.645	.698	.597	.101	83.8	90.0	77.0	13.0
11	.706	.779	.659	.120	81.7	83.6	76.9	6.7
12	.763	.817	.703	.114	83.2	88.0	75.5	12.5
13	.720	.793	.647	.146	85.1	90.5	76.9	13.6
14	<i>Sunday.</i>							
15	.632	.682	.558	.124	80.5	86.0	74.0	12.0
16	.659	.734	.608	.126	81.8	86.0	75.5	10.5
17	.740	.791	.692	.099	81.3	85.3	75.0	10.3
18	.761	.839	.683	.156	83.5	89.5	73.3	16.2
19	.669	.741	.574	.167	85.5	92.2	77.5	14.7
20	.578	.641	.506	.135	84.9	90.7	79.0	11.7
21	<i>Sunday.</i>							
22	.570	.611	.510	.101	83.5	90.0	76.7	13.3
23	.586	.650	.541	.109	82.4	88.5	76.4	12.1
24	.642	.697	.595	.102	84.4	90.4	76.3	14.1
25	.659	.710	.599	.111	83.3	87.0	77.9	9.1
26	.605	.653	.540	.113	83.0	87.0	77.2	9.8
27	.575	.632	.514	.118	80.6	82.8	75.0	7.8
28	<i>Sunday.</i>							
29	.613	.669	.559	.110	83.9	89.7	75.2	14.5
30	.623	.693	.541	.152	84.4	89.5	77.0	12.5
31	.620	.673	.547	.126	84.7	89.2	77.2	12.0

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of August, 1853—Continued.*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a cubic foot of air.	Additional Weight of vapour required for complete saturation.	Mean degree of Humidity complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	79.9	3.6	78.6	4.9	0.958	10.28	1.72	0.857
2	80.1	3.3	78.9	4.5	0.968	10.37	1.59	.867
3	81.5	4.8	79.8	6.5	0.996	10.60	2.42	.814
4	81.4	4.0	80.0	5.4	1.002	10.70	1.98	.844
5	80.7	3.1	79.6	4.2	0.989	10.60	1.50	.876
6	80.7	2.8	79.7	3.8	0.993	10.63	1.37	.886
7	<i>Sunday.</i>							
8	79.2	2.3	78.3	3.2	0.950	10.22	1.09	.904
9	80.2	2.7	79.3	3.6	0.978	10.51	1.28	.891
10	80.6	3.2	79.5	4.3	0.985	10.57	1.53	.874
11	79.4	2.3	78.6	3.1	0.957	10.32	1.05	.908
12	80.5	2.7	79.5	3.7	0.987	10.57	1.32	.889
13	81.1	4.0	79.7	5.4	0.992	10.61	1.96	.844
14	<i>Sunday.</i>							
15	78.4	2.1	77.6	2.9	0.928	10.01	0.97	.912
16	79.5	2.3	78.7	3.1	0.960	10.35	1.05	.908
17	79.4	1.9	78.7	2.6	0.962	10.35	0.89	.921
18	80.3	3.2	79.2	4.3	0.975	10.48	1.52	.873
19	81.7	3.8	80.4	5.1	1.014	10.83	1.89	.851
20	81.8	3.1	80.7	4.2	1.025	10.95	1.54	.877
21	<i>Sunday.</i>							
22	80.3	3.2	79.2	4.3	0.975	10.48	1.52	.873
23	80.3	2.1	79.5	2.9	0.987	10.60	1.01	.913
24	80.8	3.6	79.5	4.9	0.987	10.55	1.76	.857
25	81.0	2.3	80.2	3.1	1.008	10.81	1.12	.906
26	80.5	2.5	79.6	3.4	0.989	10.63	1.19	.899
27	79.3	1.3	78.8	1.8	0.964	10.40	0.61	.945
28	<i>Sunday.</i>							
29	80.9	3.0	79.8	4.1	0.996	10.66	1.47	.879
30	80.8	3.6	79.5	4.9	0.987	10.55	1.76	.857
31	80.9	3.8	79.5	5.2	0.987	10.55	1.87	.849

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of August, 1853—(Continued.)*

Date.	Max. Solar radiation.	Rain.	Prevailing direction of the Wind.	General aspect of the Sky.
	0	Inc.		
1	....	..	S. E. or S. W. or W. or calm.	Cloudy.
2	....	..	Calm or N. E. or W. S. W. or S. or N.	Overcast with rain. [or $\cap$ i till 7 P. M. Cloudless afterwards.
3	....	0.30	Calm or W. or S.	Cloudy till 8 A. M. Scattered $\vee$ i or $\wedge$ i
4	....	..	N. or W.	Cloudless till 2 A. M. Cloudy or scattered $\cap$ i afterwards also raining at 7 P. M.
5	....	..	Calm or S. W.	Cloudy and also drizzling from 4 P. M. to 6 P. M. [4 A. M.
6	....	0.75	Calm or S. or S. E.	Cloudy and also drizzling or raining till [till whole day.
7	Sunday.	0.46	S. E. or calm or N. W.	Cloudy or overcast also raining or drizzling
8	....	0.23	Calm or S. W. or W. or S. E.	Cloudy and also drizzling till 6 A. M. [zling occasionally.
9	....	0.68	S. E.	Cloudy or scattered $\vee$ i or $\cap$ i also driz-
10	....	0.29	S. E. or S.	Cloudy and constantly drizzling, also smart shower of rain between 8 & 9 A. M. and 8 & 9 P. M.
11	....	0.25	S.	Cloudy and occasionally drizzling.
12	....	..	Calm or S.	Cloudless till 7 A. M. Scattered $\cap$ i or $\vee$ i afterwards. [zling.
13	Sunday.	5.50	S. or S. E. or N. W.	Overcast or cloudy with constantly driz-
14	....	0.41	S. or calm.	Overcast or cloudy with constantly drizzling, also a shower of rain from 6 to 8 A. M.
15	....	0.23	[high at 1 P. M. S. or S. E. blowing	Overcast or cloudy with constant drizzling.
16	....	0.34	S. E. or S.	Scattered $\vee$ i or $\cap$ i or cloudy with constant
17	....	..	S.	Scattered $\vee$ i or $\wedge$ i or $\cap$ i. [drizzling.
18	....	..	S. or S. W.	Scattered $\vee$ i till 3 P. M. Cloudy with drizzling afterwards and a shower of rain between 4 & 5 P. M. [7½ P. M.
19	Sunday.	0.35	S. E.	Cloudy and also raining at 10 A. M. and
20	95.5	0.60	S. E. or E.	Scattered $\vee$ i or $\vee$ i or $\wedge$ i till noon, cloudy and raining and thundering afterwards.
21	109.0	0.75	E. or S. E.	Scattered $\vee$ i or $\wedge$ i.
22	106.2	0.32	S. or E. or S. S. E.	Scattered $\vee$ i or $\vee$ i or $\wedge$ i till 10 A. M. Cloudy with occasional drizzling afterwards, a shower of rain between 9 & 10 A. M.
23	105.0	..	S. E.	Cloudy and drizzling occasionally.
24	....	..	S. E. or Calm.	Cloudy and constantly drizzling.
25	....	1.75	S. E. or Calm.	
26	Sunday.	0.14	S. E. or E.	Cloudless till 4 A. M. overcast or scattered $\cap$ i till 7 P. M. Cloudless afterwards, also little rain at 3 P. M.
27	102.5	..	E. or S. E.	Scattered $\vee$ i or $\vee$ i or $\cap$ i or cloudy till 7 A. M. Cloudless afterwards. Also little rain at 1 & 4 P. M.
28	104.0	0.09	Ditto.	Cloudless till 2 A. M. Cloudy with little thundg. till 7 P. M. Cloudless afterwards.
29	105.2	0.09	Ditto.	

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of September, 1853.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer.			Mean Dry Bulb Thermometer.	Range of the Tem- perature.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.645	29.714	29.567	0.147	84.6	89.0	77.9	11.1
2	29.610	.667	.530	.137	84.3	91.0	77.3	13.7
3	29.608	.661	.555	.106	83.8	87.5	77.6	9.9
4	<i>Sunday.</i>							
5	29.660	.720	.596	.124	84.6	88.5	78.4	10.1
6	29.596	.645	.533	.112	84.5	88.0	79.4	8.6
7	29.574	.632	.511	.121	84.8	88.4	79.5	8.9
8	29.585	.649	.523	.126	80.0	82.0	75.8	6.2
9	29.636	.694	.570	.124	81.0	84.6	75.6	9.0
10	29.614	.672	.535	.137	83.8	89.4	75.0	14.4
11	<i>Sunday.</i>							
12	29.606	.666	.544	.122	84.3	89.2	77.0	12.2
13	29.637	.698	.588	.110	85.8	92.0	77.5	14.5
14	29.695	.748	.646	.102	86.1	91.7	77.9	13.8
15	29.721	.783	.654	.129	86.6	92.0	83.0	9.0
16	29.721	.789	.638	.151	86.7	92.6	79.4	13.2
17	29.734	.798	.646	.152	85.1	93.4	..	..
18	<i>Sunday.</i>							
19	29.758	.804	.674	.130	82.4	86.3	73.6	12.7
20	29.750	.817	.665	.152	84.5	91.0	76.2	14.8
21	29.718	.788	.642	.146	86.1	92.9	77.5	15.4
22	29.697	.760	.628	.132	87.4	93.5	79.6	13.9
23	29.691	.762	.615	.147	87.1	93.0	79.8	13.2
24	29.671	.726	.606	.120	86.0	91.3	79.9	11.4
25	<i>Sunday.</i>							
26	29.605	.668	.534	.134	80.1	86.0	74.9	11.1
27	29.564	.608	.517	.091	78.8	79.9	73.8	6.1
28	29.600	.662	.536	.126	79.8	84.0	74.3	9.7
29	29.661	.730	.610	.120	82.5	88.0	74.0	14.0
30	29.693	.762	.630	.132	84.3	90.0	75.9	14.1



*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of September, 1853—(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a cubic foot of air.	Additional weight of Vapour required for complete saturation.	Mean degree of Humidity complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	81.1	3.5	79.9	4.7	0.998	10.67	1.72	.861
2	80.9	3.4	79.7	4.6	0.992	10.61	1.67	.864
3	81.1	2.7	80.2	3.6	1.007	10.79	1.31	.892
4	<i>Sunday.</i>							
5	81.9	2.7	81.0	3.6	1.033	11.05	1.34	.892
6	82.1	2.4	81.3	3.2	1.042	11.17	1.18	.904
7	81.8	3.0	80.8	4.0	1.026	10.98	1.48	.881
8	78.5	1.5	77.9	2.1	0.938	10.12	0.69	.936
9	79.1	1.9	78.4	2.6	0.952	10.25	0.89	.920
10	79.8	4.0	78.3	5.5	0.950	10.16	1.94	.840
11	<i>Sunday.</i>							
12	80.1	4.2	78.6	5.7	0.958	10.26	2.02	.836
13	80.3	5.5	78.3	7.5	0.949	10.12	2.71	.789
14	81.8	4.3	80.3	5.8	1.012	10.78	2.17	.832
15	82.6	4.0	81.3	5.3	1.042	11.13	2.01	.847
16	82.4	4.3	81.0	5.7	1.032	11.01	2.17	.835
17	80.8	4.3	79.3	5.8	0.979	10.46	2.11	.832
18	<i>Sunday.</i>							
19	79.7	2.7	78.7	3.7	0.962	10.33	1.28	.890
20	80.4	4.1	78.9	5.6	0.968	10.34	2.01	.837
21	81.4	4.7	79.8	6.3	0.994	10.62	2.33	.820
22	82.1	5.3	80.2	7.2	1.009	10.73	2.72	.798
23	81.6	5.5	79.7	7.4	0.991	10.57	2.76	.793
24	81.0	5.0	79.3	6.7	0.978	10.44	2.47	.809
25	<i>Sunday.</i>							
26	78.5	1.6	77.9	2.2	0.937	10.12	0.72	.934
27	78.0	0.8	77.7	1.1	0.931	10.09	0.35	.966
28	78.2	1.6	77.6	2.2	0.928	10.03	0.72	.933
29	79.2	3.3	78.0	4.5	0.939	10.09	1.55	.867
30	80.2	4.1	78.7	5.6	0.962	10.29	1.99	.838

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of September, 1853—(Continued.)*

Date.	Max. Solar radiation	Rain.	Prevailing direction of the Wind.	General aspect of the Sky.
	o	Inc.		
1	107.0	..	S. E. or E. or N. E.	Cloudless till 3 A. M. scattered $\cap$ i and $\cup$ i till 9 P. M. Cloudless afterwards.
2	111.0	..	E. or N. E. or S. E.	Cloudless till 2 A. M. scattered $\cap$ i or $\cup$ i or $\cap$ i till 2 P. M. cloudy and rainy till 8 P. M. Cloudless afterwards.
3	101.0	0.41	E. or S. E.	Cloudy, raining occasionally till 7. P. M. Cloudless afterwards.
4	<i>Sunday.</i>			
5	105.8	0.36	Calm or S.	Cloudy.
6	..	..	Calm or S.	Ditto [6 P. M. and raining at 11 P. M.
7	..	..	S. sharp at 3 A. M.	Overcast or cloudy, also drizzling at 5 and
8	..	1.92	S. or S. W.	Overcast, raining or drizzling, nearly the whole day.
9	..	..	S. or calm.	Overcast and also drizzling till 8 A. M. also a shower of rain between 5 and 6 P. M.
10	98.0	0.47	S. or S. W. or W.	Cloudy.
11	<i>Sunday.</i>			
12	..	..	W. or S.	Cloudy.
13	105.0	..	S. or W. or calm.	Cloudy.
14	104.3	..	S. W. or calm.	Cloudy.
15	111.8	..	S. or S. S. W.	Cloudy or scattered $\cap$ i and $\cup$ i.
16	107.0	..	S.	Scattered $\cup$ i or $\cap$ i or $\cup$ i or overcast.
17	108.0	..	S. or S. W.	Overcast or cloudy; also raining or drizzling after 8 P. M.
18	<i>Sunday.</i>	0.70		
19	104.4	0.95	Calm or S.	Overcast or cloudy also raining between 2
20	101.0	..	S. or W. or calm.	Cloudy or scattered $\cap$ i or $\cup$ i. [and 3 P. M.
21	117.5	..	S. W. or N. W. or W. or calm.	Cloudless or scattered $\cap$ i.
22	102.0	..	Calm or N. W.	Cloudless till 3 A. M. afterwards scattered $\cup$ i or $\cap$ i or $\cap$ i or cloudy.
23	102.2	..	Calm or N. E. or N. W.	Scattered $\cap$ i till 7 A. M. cloudy or scattered $\cap$ i, afterwards also drizzling at 5 P. M.
24	113.5	..	Calm or S. or N. E. or E. or S. E.	Scattered $\cap$ i or $\cup$ i or $\cup$ i or $\cap$ i.
25	<i>Sunday.</i>			
26	..	1.42	N. E. or E. N. E.	Overcast and drizzling or raining.
27	..	1.85	E.	Overcast and drizzling or raining.
28	..	0.70	E.	Overcast and raining or drizzling.
29	96.0	0.37	E. or S. E. or S.	Cloudy or scattered $\cap$ i also raining at 1 A. M. afterwards occasionally drizzling.
30	107.4	..	S. E. or E.	Cloudless, or scattered $\cap$ i or $\cup$ i or $\cap$ i.

$\cap$  i Cirri,  $\cap$  i Cumuli, — i Strati,  $\cup$  i Cirro cumulo,  $\cup$  i Cirro strati,  $\sim$  i Cumulo strati,  $\cup$  i Nimbi.

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of October, 1853.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer.			Mean Dry Bulb Thermometer.	Range of the Tem- perature.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
1	Inches. 29.682	Inches. 29.751	Inches. 29.619	Inches. 0.132	o 83.8	o 87.3	o 77.5	o 9.8
2	<i>Sunday.</i>							
3	.672	.737	.604	.133	84.3	90.0	73.9	16.1
4	.665	.717	.594	.123	83.3	87.5	77.2	10.3
5	.711	.777	.634	.143	78.4	79.8	73.2	6.6
6	.771	.831	.716	.115	80.0	86.5	73.0	13.5
7	.850	.913	.795	.118	79.6	83.0	74.0	9.0
8	.909	.979	.853	.126	82.8	88.1	74.6	13.5
9	<i>Sunday.</i>							
10	.872	.934	.816	.118	85.1	90.7	77.4	13.3
11	.857	.916	.805	.111	82.8	88.0	75.0	13.0
12	.851	.923	.800	.123	81.4	87.4	71.9	15.5
13	.849	.915	.788	.127	82.1	88.9	73.6	15.3
14	.873	.942	.829	.113	82.6	88.6	73.3	15.3
15	.901	.977	.855	.122	82.1	88.4	73.4	15.0
16	<i>Sunday.</i>							
17	.914	.979	.868	.111	81.3	85.0	73.5	11.5
18	.879	.930	.836	.094	81.2	84.6	76.0	8.6
19	.853	.914	.794	.120	81.7	87.4	73.2	14.2
20	.867	.933	.818	.115	81.6	86.3	73.9	12.4
21	.873	.947	.820	.127	79.2	83.3	70.0	13.3
22	.846	.904	.801	.103	79.2	84.4	72.0	12.4
23	<i>Sunday.</i>							
24	.935	30.005	.880	.125	80.1	87.0	70.2	16.8
25	.926	29.998	.863	.135	79.4	85.5	70.0	15.5
26	.940	30.011	.884	.127	79.1	84.8	70.0	14.8
27	30.015	.103	.967	.136	79.8	86.6	70.0	16.6
28	.026	.100	.969	.131	80.4	86.5	71.7	14.8
29	29.999	.082	.936	.146	79.9	86.6	70.0	16.6
30	<i>Sunday.</i>							
31	.983	.057	.929	.128	78.2	86.2	67.5	18.7

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of October, 1853—(Continued.)*

Date.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a cubic foot of air.	Additional weight of Va- pour required for com- plete saturation.	Mean degree of Humi- dity, complete satura- tion being unity.
1	80.2	3.6	78.9	4.9	Inches. 0.967	T. gr. 10.37	T. gr. 1.73	0.857
2	<i>Sunday.</i>							
3	80.2	4.1	78.7	5.6	0.962	10.29	1.99	.838
4	79.4	3.9	78.0	5.3	0.939	10.09	1.84	.846
5	76.4	2.0	75.6	2.8	0.870	9.42	0.89	.914
6	77.5	2.5	76.5	3.5	0.897	9.67	1.14	.895
7	78.3	1.3	77.8	1.8	0.934	10.09	0.60	.944
8	80.0	2.8	79.0	3.8	0.969	10.42	1.33	.887
9	<i>Sunday.</i>							
10	80.8	4.3	79.3	5.8	0.978	10.46	2.11	.832
11	76.8	6.0	74.4	8.4	0.837	9.00	2.75	.766
12	75.5	5.9	73.0	8.4	0.801	8.62	2.65	.765
13	76.6	5.5	74.4	7.7	0.837	9.00	2.51	.782
14	76.2	6.4	73.5	9.1	0.815	8.74	2.94	.748
15	75.7	6.4	73.0	9.1	0.801	8.60	2.91	.747
16	<i>Sunday.</i>							
17	75.9	5.4	73.7	7.6	0.818	8.82	2.42	.785
18	77.8	3.4	76.5	4.7	0.895	9.65	1.56	.861
19	77.7	4.0	76.2	5.5	0.886	9.54	1.83	.839
20	76.1	5.5	73.9	7.7	0.823	8.87	2.47	.782
21	73.1	6.1	70.3	8.9	0.734	7.93	2.63	.751
22	73.2	6.0	70.5	8.7	0.733	7.98	2.58	.756
23	<i>Sunday.</i>							
24	73.4	6.7	70.4	9.7	0.735	7.94	2.90	.732
25	73.1	6.3	70.2	9.2	0.732	7.91	2.71	.745
26	72.3	6.8	69.1	10.0	0.706	7.62	2.91	.724
27	73.2	6.6	70.2	9.6	0.731	7.89	2.86	.734
28	73.8	6.6	70.9	9.5	0.747	8.07	2.87	.738
29	71.8	8.1	67.9	12.0	0.679	7.33	3.45	.690
30	<i>Sunday.</i>							
31	71.5	6.7	68.3	9.9	0.687	7.45	2.80	.727

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of October, 1853—(Continued.)*

Date.	Max. Solar radiation.	Rain.	Prevailing direction of the Wind.	General aspect of the Sky.
1	o 91.0	Inc. ..	Calm or S. W.	Cloudy also drizzling between 7 and 11 P. M.
2	<i>Sunday.</i>	0.90		
3	112.0	..	E. or N. E.	Cloudless till 6 A. M. scattered $\cap$ i or cloudy afterwards and also much lightning on S. W. side between 6 and 9 P. M.
4	97.8	0.08	E.	Scattered $\nabla$ i or $\vee$ i or $\cap$ i also overcast and raining at 11 P. M.
5	....	0.76	E. or N. E. or S.	Cloudy and occasionally raining.
6	....	0.12	E. or S.	Cloudy or overcast, raining occasionally.
7	....	0.66	E. or N. E. or S. E.	Ditto.
8	101.8	..	Calm or E. or S. W.	Cloudy or scattered $\cap$ i or $\nabla$ i or $\vee$ i.
9	<i>Sunday.</i>			
10	110.5	..	Calm or S. S. W.	Cloudless till 7 A. M. scattered $\cap$ i till 5 P. M. and cloudless afterwards.
11	106.0	..	Calm or N. W.	Cloudless.
12	108.5	..	Calm or W.	Cloudless till 11 A. M. scattered $\cap$ i till 6 P. M. and cloudless afterwards.
13	101.8	..	Calm or N. W.	Cloudless till 8 A. M. scattered $\cap$ i till 5 P. M. and cloudless afterwards.
14	109.7	..	Ditto.	Cloudless. [wards
15	105.0	..	Ditto.	Cloudless till 7 A. M. scattered $\nabla$ i after-
16	<i>Sunday</i>			
17	....	..	N. W. or N.	Scattered $\vee$ i or cloudy.
18	94.0	2.42	Calm or N. or S. E.	Cloudy, also raining at 7 P. M.
19	106.0	..	N. W.	Scattered $\nabla$ i or $\vee$ i or $\cap$ i.
20	102.0	..	Ditto.	Cloudless till 6 A. M. scattered $\nabla$ i or $\vee$ i till 6 P. M. cloudless afterwards.
21	98.0	..	N. or N. W.	Scattered $\vee$ i till 8 A. M. cloudy afterwards.
22	97.0	..	N. W.	Cloudy.
23	<i>Sunday.</i>			
24	101.0	..	Calm or N. W. or W.	Scattered $\cap$ i or $\vee$ i or cloudless.
25	100.0	..	Calm or W.	Scattered $\cap$ i or $\vee$ i till 4 P. M. cloudless afterwards.
26	105.9	..	W.	Scattered $\vee$ i or cloudless. [wards.
27	113.0	..	Calm or E. or S. W.	Cloudless till 6 A. M. scattered $\cap$ i after-
28	111.5	..	Calm or E. or N. E.	Scattered $\vee$ i or $\cap$ i.
29	103.0	..	W. or N. W. [or N.	Scattered $\nabla$ i or $\cap$ i.
30	<i>Sunday.</i>			
31	109.0	..	Calm or N. W.	Cloudless.



*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of November, 1853.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer.			Mean Dry Bulb Thermometer.	Range of the Temperature.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.958	30.032	29.892	0.140	78.1	86.2	68.0	18.2
2	.900	29.980	.830	.150	78.6	86.2	68.3	17.9
3	.867	.947	.820	.127	78.7	86.0	68.4	17.6
4	.848	.919	.782	.137	78.7	86.9	70.5	16.4
5	.849	.913	.800	.113	79.3	86.7	69.4	17.3
6	<i>Sunday.</i>							
7	.885	.957	.818	.139	79.2	86.2	68.6	17.6
8	.846	.928	.790	.138	79.0	86.6	69.4	17.2
9	.853	.912	.800	.112	79.8	87.6	72.7	14.9
10	.910	.988	.847	.141	80.1	86.9	72.6	14.3
11	.935	30.018	.852	.166	77.3	85.5	66.7	18.8
12	.865	29.949	.796	.153	76.6	85.6	64.9	20.7
13	<i>Sunday.</i>							
14	.941	30.012	.886	.126	78.0	86.0	67.5	18.5
15	.939	.030	.877	.153	77.5	86.5	67.3	19.2
16	.868	29.946	.801	.145	77.1	86.5	66.0	20.5
17	.903	.990	.852	.138	78.4	86.7	72.8	13.9
18	.919	30.000	.861	.139	77.9	85.4	67.8	17.6
19	.933	.017	.882	.135	74.9	83.0	65.5	17.5
20	<i>Sunday.</i>							
21	.963	.037	.908	.129	69.1	78.0	58.0	20.0
22	.969	.050	.902	.148	69.6	79.2	57.6	21.6
23	.938	.026	.863	.158	70.3	80.0	58.4	21.6
24	.934	29.997	.887	.110	71.2	80.0	60.0	20.0
25	.935	30.015	.858	.157	71.5	80.9	59.7	21.2
26	.918	29.991	.852	.139	71.6	80.0	60.4	19.6
27	<i>Sunday.</i>							
28	.922	.991	.868	.123	69.3	79.3	58.3	21.0
29	.933	30.007	.868	.139	69.3	80.7	56.4	24.3
30	.976	.065	.931	.134	70.4	81.0	57.7	23.3

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of November, 1853—(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a cubic foot of air.	Additional weight of Vapour required for complete saturation.	Mean degree of Humidity complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	71.3	6.8	68.0	10.1	0.681	7.38	2.84	0.722
2	72.3	6.3	69.4	9.2	0.712	7.72	2.66	.744
3	73.0	5.7	70.4	8.3	0.736	7.97	2.44	.766
4	73.4	5.3	71.0	7.7	0.751	8.12	2.29	.780
5	73.1	6.2	70.3	9.0	0.733	7.93	2.66	.749
6	<i>Sunday.</i>							
7	73.6	5.6	71.1	8.1	0.754	8.15	2.41	.772
8	73.7	5.3	71.3	7.7	0.759	8.20	2.30	.781
9	74.5	5.3	72.2	7.6	0.780	8.41	2.34	.782
10	74.3	5.8	71.7	8.4	0.769	8.30	2.54	.766
11	68.8	8.5	64.3	13.0	0.603	6.55	3.43	.656
12	70.4	6.2	67.3	9.3	0.666	7.24	2.53	.741
13	<i>Sunday.</i>							
14	72.0	6.0	69.2	8.8	0.708	7.67	2.52	.753
15	71.6	5.9	68.8	8.7	0.699	7.57	2.47	.754
16	70.9	6.2	67.9	9.2	0.678	7.37	2.55	.743
17	71.7	6.7	68.5	9.9	0.692	7.50	2.81	.727
18	72.0	5.9	69.2	8.7	0.709	7.67	2.49	.755
19	67.4	7.5	63.3	11.6	0.583	6.35	2.93	.685
20	<i>Sunday.</i>							
21	62.3	6.8	57.9	11.2	0.488	5.37	2.41	.690
22	63.5	6.1	59.8	9.8	0.519	5.71	2.19	.723
23	64.4	5.9	60.9	9.4	0.538	5.93	2.15	.734
24	65.8	5.4	62.8	8.4	0.573	6.31	1.99	.760
25	66.1	5.4	63.1	8.4	0.579	6.37	2.01	.760
26	66.0	5.6	62.9	8.7	0.575	6.31	2.09	.751
27	<i>Sunday.</i>							
28	63.0	6.3	59.1	10.2	0.507	5.60	2.23	.715
29	63.7	5.6	60.3	9.0	0.528	5.82	2.01	.743
30	64.3	6.1	60.6	9.8	0.534	5.86	2.24	.723

*Abstract of the Results of the Hourly Meteorological Observations  
taken at the Surveyor General's Office, Calcutta, in the  
month of November, 1853—(Continued.)*

Date.	Max. Solar radiation.	Rain.	Prevailing direction of the Wind.	General aspect of the Sky.
	o	Inc.		
1	108.0	..	Calm or N. W.	Cloudless till noon scattered $\searrow$ i till 4 P. M. cloudless afterwards.
2	108.0	..	Ditto.	Cloudless till 11 A. M. scattered $\circ$ i or $\searrow$ i till 8 P. M. cloudless afterwards.
3	102.0	..	N. or N. W.	Cloudless till 5 A. M. scattered $\searrow$ i till 7 P. M. cloudless afterwards.
4	103.0	..	Calm or N. W.	Cloudless till noon scattered $\circ$ i till 7 P. M. cloudless afterwards.
5	108.0	..	Calm or W.	Cloudless till 10 A. M. $\searrow$ i and $\circ$ i till 4 P. M. cloudless afterwards.
6	<i>Sunday.</i>			
7	102.0	..	Calm or S. W.	Cloudless till 11 A. M. scattered $\circ$ i till 4 P. M. cloudless afterwards.
8	102.0	..	S. W.	Cloudless.
9	105.0	..	Ditto.	Ditto.
10	104.0	..	S. W. or W.	Ditto.
11	100.0	..	N. E.	Ditto.
12	100.8	..	N. or E. or S.	Nearly cloudless.
13	<i>Sunday.</i>			
14	104.0	..	S. W.	Cloudless.
15	100.5	..	S.	Ditto.
16	101.5	..	S. W. or S.	Cloudless and occasionally scattered $\circ$ i or $\searrow$ i.
17	103.6	..	S.	Cloudy till 8 A. M. cloudless till 1 P. M. scattered $\circ$ i till 4 P. M. cloudless afterwards.
18	100.5	..	Calm or N. E. or W.	Cloudy nearly throughout the day.
19	103.0	..	N. W.	Nearly cloudless.
20	<i>Sunday.</i>			
21	88.5	..	Variable.	Cloudless.
22	95.0	..	N. W. or S. W. or W.	Ditto.
23	93.8	..	Calm or W.	Ditto.
24	92.0	..	W.	Ditto.
25	100.5	..	N. W.	Ditto.
26	93.4	..	Calm or N. W. or W.	Scattered $\searrow$ i or $\searrow$ i or $\searrow$ i till 6 P. M. cloudless afterwards.
27	<i>Sunday.</i>			
28	92.0	..	Calm or N. W.	Cloudless.
29	98.0	..	W. or N. W.	Ditto.
30	105.0	..	Calm or N. N. W.	Ditto.

*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of May, 1853.*

Maximum pressure observed at 9.50 A. M.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Direction of the Wind.	
1	29.275	87.0	97.5	80.5	..	..	N.	Clear.
2	29.293	89.4	94.5	72.5	..	..	N.	Ditto.
3	29.273	89.0	94.1	73.0	..	..	W.	Ditto.
4	29.273	88.5	92.2	68.9	..	..	W.	Ditto.
5	29.235	87.6	93.0	71.0	..	..	W.	Ditto.
6	29.309	86.9	93.2	71.6	..	..	W.	Ditto.
7	29.365	88.0	94.0	75.0	..	..	S.	Ditto.
8	29.307	86.8	93.5	72.0	..	..	N.	Ditto.
9	29.203	87.3	94.0	72.0	..	..	W.	^ in zenith.
10	29.189	91.0	97.5	75.5	..	..	S. E.	Clear.
11	29.297	89.5	89.5	79.4	..	..	N.	^ all over.
12	29.223	88.0	88.0	79.0	..	..	E.	Hazy.
13	29.235	89.5	91.5	71.5	..	..	S.	Clear.
14	29.279	89.0	91.8	73.4	..	..	S.	Ditto.
15	29.285	86.0	90.0	72.0	..	..	W.	Ditto.
16	29.429	86.6	87.6	71.9	..	..	N.W.	Ditto.
17	29.409	86.6	88.9	71.0	..	..	W.	Ditto.
18	29.325	86.7	90.2	74.5	..	..	W.	Hazy.
19	29.357	87.8	91.0	75.5	..	..	W.	Ditto.
20	29.335	90.5	93.8	79.5	..	..	W.	^ scattered.
21	29.397	88.0	94.9	76.0	..	..	W.	Clear.
22	29.401	89.0	95.6	78.5	..	..	S.W.	Ditto.
23	29.389	90.5	96.5	80.4	..	..	W.	^ few in zenith.
24	29.403	90.9	97.7	81.0	..	..	W.	Clear.
25	29.307	92.0	98.9	81.0	..	..	N.W.	Hazy.
26	29.193	90.8	100.7	80.5	..	..	W.	Clear.
27	29.173	87.9	102.5	84.5	..	..	W.	Ditto.
28	29.205	90.0	100.0	81.0	..	..	W.	Ditto.
29	29.301	90.8	93.5	77.0	..	..	N.	Hazy to N.
30	29.235	90.0	98.2	79.0	..	..	W.	Clear.
31	29.305	90.8	93.0	77.0	..	..	W.	Ditto.
Mean.	29.297	88.8	94.1	75.7	..	..	..	....

Barometer Observations corrected for capillarity only.

Symbols, ..... {  
 \ Cirrus.  
 ^ Cirro-strati.  
 ^ Cumuli.  
 ^ Cumulo-strati.  
 ^ Nimbi or Nimbus.

W. MUIR, Secy. to Govt. N. W. P.

*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of May, 1853. LATITUDE.*

Observations at apparent Noon.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Direction of the Wind.	
1	29.267	88.5	99.4	82.0	..	..	N.	Clear.
2	29.269	87.9	96.8	69.5	..	..	N.	Ditto.
3	29.245	88.5	96.0	69.0	..	..	W.	Ditto.
4	29.251	88.0	95.5	74.0	..	..	W.	Ditto.
5	29.229	87.8	95.4	73.9	..	..	W.	Ditto.
6	29.301	87.5	98.0	71.5	..	..	W.	∪ scattered.
7	29.335	86.5	99.9	78.0	..	..	W.	Clear.
8	29.279	88.0	96.0	73.8	..	..	N.	∩ in zenith.
9	29.183	87.0	98.1	78.0	..	..	W.	Clear.
10	29.153	91.9	101.0	79.5	..	..	S. E.	Ditto.
11	29.279	91.0	95.0	77.3	..	..	N.	∩ in horizon to N. and E.
12	29.205	90.0	91.4	77.5	..	..	S.	Hazy.
13	29.229	90.4	94.8	71.5	..	..	S. W.	∩ scattered.
14	29.255	84.9	94.5	73.8	..	..	S.	Clear.
15	29.239	88.0	92.0	71.5	..	..	W.	Ditto.
16	29.405	87.9	91.9	73.9	..	..	N. W.	Ditto.
17	29.387	88.0	93.5	70.0	..	..	W.	Ditto.
18	29.319	86.9	92.8	75.4	..	..	W.	∪ all over.
19	29.341	87.9	92.1	76.4	..	..	W.	Hazy.
20	29.305	90.7	97.8	81.0	..	..	W.	∩ scattered.
21	29.335	88.8	95.5	77.5	..	..	N. W.	Clear.
22	29.375	89.5	98.2	80.0	..	..	S. W.	Ditto.
23	29.335	90.7	100.9	78.5	..	..	N.	∩ scattered.
24	29.345	90.5	100.9	82.4	..	..	W.	Clear.
25	29.279	89.0	104.2	84.6	..	..	N. W.	Hazy.
26	29.137	88.9	102.5	81.8	..	..	W.	Clear.
27	29.149	89.0	105.0	86.4	..	..	W.	Ditto.
28	29.177	91.0	102.9	83.4	..	..	W.	Ditto.
29	29.277	91.1	97.5	78.6	..	..	N.	Hazy in horizon.
30	29.205	91.0	99.5	79.8	..	..	W.	Clear.
31	29.205	92.0	97.5	79.0	..	..	W.	Ditto.
Mean.	29.268	89.0	97.3	77.1	..	..	..	....



*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of May, 1853.*

Minimum pressure observed at 4 P. M.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.	Rain Gauges.	
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Mean.		3 Ft. 2 In. from the ground.	Direction of the Wind.
1	29.185	90.0	101.5	80.0	100.0	85.0	92.5	Clear	..	N.
2	29.165	90.0	99.5	70.5	99.1	82.5	90.8	Ditto	..	N.
3	29.165	90.0	99.5	70.5	99.1	84.5	91.8	Ditto	..	W.
4	29.155	88.0	99.3	75.0	98.0	82.0	90.0	Ditto	..	W.
5	29.159	86.6	101.0	76.2	99.0	82.6	90.8	Ditto	..	W.
6	29.217	89.1	102.1	77.0	101.0	82.0	91.5	Ditto	..	N. W.
7	29.255	84.0	103.9	79.9	102.0	82.0	92.0	Ditto	..	N.
8	29.169	89.0	102.6	79.0	102.0	81.8	91.9	✓ in zenith	..	N.
9	29.071	88.1	100.6	78.1	99.1	82.0	90.55	✓ to W.	..	W.
10	29.079	91.2	100.0	80.0	101.0	88.5	94.75	✓ to N. [S.	..	S. E.
11	29.181	91.2	96.0	79.5	95.5	81.0	88.25	Hazy a few ✓ to 0.12	..	N. E.
12	29.063	90.5	95.6	79.0	95.5	82.0	88.75	✓ $\frac{2}{3}$ of sky	..	S.
13	29.173	86.5	97.0	74.0	96.6	82.0	89.3	✓ scattered	..	W.
14	29.179	83.4	96.6	75.5	96.0	81.5	88.75	Clear	..	S. W.
15	29.173	88.5	93.6	73.0	94.0	77.5	85.75	Ditto	..	W.
16	29.315	83.0	94.8	75.5	94.2	77.0	85.6	Ditto	..	N. W.
17	29.287	87.9	97.0	76.6	96.0	77.0	86.5	Ditto [of S.	..	N. W.
18	29.245	87.0	95.2	77.0	94.2	80.6	87.4	✓ scattered $\frac{1}{3}$	..	S.
19	29.265	88.5	93.0	77.5	94.0	81.6	87.8	....	..	W.
20	29.257	91.4	99.0	82.0	98.8	84.5	91.65	✓ scattered	..	W.
21	29.303	90.0	100.4	82.9	99.8	85.0	92.4	Clear	..	N.
22	29.293	90.0	100.3	81.9	99.9	84.8	92.35	✓ few to N.	..	W.
23	29.225	91.2	102.5	78.0	101.0	84.7	92.85	✓ scattered	..	N.
24	29.245	91.8	103.5	83.7	103.0	85.0	94.0	Clear	..	W.
25	29.155	89.9	106.0	85.0	104.8	86.7	95.75	Hazy	..	W.
26	29.085	89.6	99.6	81.5	100.9	88.0	94.45	Clear	..	W.
27	29.057	90.9	107.5	86.0	102.0	89.0	95.5	Ditto	..	W.
28	29.145	90.2	90.5	77.0	107.0	90.5	98.75	Drizzling	..	S. W.
29	29.193	91.8	98.3	79.0	98.0	83.9	90.95	Clear	..	N.
30	29.059	91.8	101.0	79.9	100.0	86.9	93.45	Ditto	..	N. W.
31	29.105	91.0	106.0	87.0	106.0	87.0	96.5	Ditto	..	E.
Mean.	29.178	89.1	99.5	78.6	99.3	83.5	91.40	....	0.12	..

*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of June, 1853.*

Maximum pressure observed at 9.50 A. M.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Direction of the Wind.	
1	29.241	94.0	99.5	78.0	..	..	N.	Clear
2	29.151	90.0	101.0	79.5	..	..	N.	Ditto
3	29.143	92.8	105.8	82.0	..	..	W.	Ditto
4	29.037	91.5	105.2	72.5	..	..	W.	Ditto
5	29.067	92.0	105.0	73.0	..	..	W.	Ditto
6	29.053	91.0	106.3	69.5	..	..	W.	Ditto
7	29.077	92.0	106.0	71.0	..	..	N.	Ditto
8	29.151	93.0	101.5	71.0	..	..	N.	Ditto
9	29.057	90.8	106.2	73.0	..	..	N.W.	Hazy
10	28.977	91.0	104.8	81.0	..	..	N.	~ scattered
11	29.051	91.0	105.0	78.0	..	..	N.W.	^ in zenith
12	29.067	92.0	106.0	79.5	..	..	N.	Hazy
13	29.137	94.0	105.0	79.0	..	..	N.	Clear
14	29.149	91.0	106.2	77.0	..	..	N.W.	Ditto
15	29.231	94.0	102.0	80.0	..	..	N.	Hazy
16	29.279	94.0	93.8	80.6	..	..	N.W.	Ditto
17	29.245	96.5	86.0	80.0	..	..	N.	~ to N.
18	29.113	93.0	95.0	79.6	..	..	N. E.	^ scattered all over
19	29.149	93.0	87.5	81.5	..	..	N. E.	~ to N.
20	29.109	91.5	89.4	83.6	..	..	E.	~ all over
21	29.021	89.9	89.0	81.6	..	..	N.	~ scattered
22	28.983	91.5	91.5	82.0	..	..	E.	~ scattered all over
23	29.049	92.1	92.7	81.6	..	..	E.	~ scattered
24	29.071	92.5	94.8	82.0	..	..	N.	~ scattered
25	29.033	92.0	95.0	83.9	..	..	W.	Clear
26	29.045	92.0	98.2	81.5	..	..	N.W.	Hazy
27	29.133	94.0	95.5	82.5	..	..	E.	~ scattered all over
28	29.055	95.0	97.5	81.0	..	..	E.	~ scattered
29	29.053	92.4	92.4	82.0	..	..	N.W.	~ scattered
30	29.109	85.0	84.3	80.4	..	..	N.	~ all over
Mean.	29.101	92.15	98.27	78.92	..	..	..	....

NOTE.—The Dry Bulb and Maximum Register do not agree, the former always reads more than the latter the average difference is 1° 6' but at times it is far greater.

*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of June, 1853. LATITUDE.*

Observations at apparent Noon.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Direction of the Wind.	
1	29.219	91.5	105.3	82.9	..	..	N.	Clear
2	29.113	91.5	103.5	80.5	..	..	N.	Ditto
3	29.103	92.0	108.7	84.4	..	..	W.	Ditto
4	29.005	90.4	108.7	73.4	..	..	W.	Ditto
5	29.009	92.6	108.2	73.1	..	..	W.	Ditto
6	29.029	91.0	110.7	70.5	..	..	W.	Ditto
7	29.061	91.8	109.2	71.9	..	..	N.	Ditto
8	29.113	92.9	107.7	71.0	..	..	N.	Ditto
9	29.031	92.0	110.5	74.0	..	..	N.W.	Hazy
10	28.905	91.0	104.0	81.0	..	..	N.	✓ scattered
11	29.025	91.0	108.0	79.2	..	..	N.W.	Hazy
12	29.025	92.0	106.9	80.5	..	..	N.	Ditto
13	29.115	93.2	107.6	79.0	..	..	N.	Clear
14	29.115	94.0	110.0	79.0	..	..	N.	Ditto
15	29.181	94.5	105.0	81.6	..	..	N.	Hazy
16	29.277	91.0	86.0	77.5	..	..	W.	Stormy
17	29.229	89.4	89.3	80.5	..	..	N.	✓ to N.
18	29.083	93.9	96.6	80.5	..	..	N. E.	✓ scattered all over
19	29.105	93.4	92.4	82.4	..	..	N. E.	✓ to N.
20	29.089	92.8	90.0	84.0	..	..	E.	✓ all over
21	28.995	90.8	90.3	82.4	..	..	N.	✓ scattered
22	28.957	93.0	93.5	81.5	..	..	N. E.	✓ scattered all over
23	29.039	94.0	94.6	80.9	..	..	E.	✓ scattered
24	29.039	92.5	95.6	83.9	..	..	N.	Ditto
25	29.005	91.5	96.9	83.4	..	..	W.	Clear
26	29.019	95.0	100.8	81.5	..	..	N. W.	Hazy
27	29.101	95.5	97.8	82.7	..	..	E.	✓ scattered all over
28	28.995	95.0	98.7	82.5	..	..	E.	✓ scattered
29	29.035	93.6	94.0	81.1	..	..	N. W.	✓ all over
30	29.089	87.0	87.2	82.0	..	..	N. E.	Ditto
Mean.	29.104	92.3	100.6	79.6	..	..	..	....

*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of June, 1853. LONGITUDE.*

Minimum pressure observed at 4 P. M.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.	Rain Gauges.	
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Mean.		3 Ft. 2 In. from the ground.	Direction of the Wind.
1	29.123	96.0	108.0	85.5	108.0	90.0	99.0	Clear	..	N.
2	29.061	93.0	109.0	84.0	109.0	91.5	100.25	Ditto	..	N.
3	29.005	96.0	109.0	82.5	109.0	92.3	100.65	Ditto	..	W.
4	28.929	92.0	109.9	80.5	109.2	93.5	101.35	Ditto	..	W.
5	28.959	94.0	110.0	74.5	109.4	91.4	100.4	Ditto	..	W.
6	28.965	93.3	111.6	80.0	111.0	91.3	101.15	Ditto	..	W.
7	28.995	94.0	112.0	73.0	111.3	91.7	101.5	Ditto	..	N.
8	29.005	92.0	110.4	75.6	110.0	90.5	100.25	Ditto	..	W.
9	28.901	92.5	113.0	75.0	113.0	96.5	104.75	Hazy	..	N.W.
10	28.887	90.5	110.0	80.0	109.6	98.0	103.8	~ all over	..	N.
11	28.999	92.0	105.0	79.0	109.0	98.4	103.7	Hazy	..	N.W.
12	28.891	93.0	104.0	81.0	107.5	99.0	103.25	~ all over	..	N.
13	29.031	94.0	111.0	79.5	109.8	95.0	102.4	Clear	..	N.
14	29.035	94.6	111.0	80.0	111.0	95.5	103.25	Hazy	..	W.
15	29.077	96.0	106.0	82.0	106.0	97.0	101.5	Ditto	..	N.
16	29.171	90.2	93.5	78.9	98.5	93.3	95.9	~ to N.	..	N.W.
17	29.125	92.0	93.4	79.6	83.9	93.0	88.45	Ditto [over	0.18	N.
18	29.013	95.5	98.0	85.0	87.5	97.0	92.25	~ scattered all	..	E.
19	29.005	95.0	92.0	82.3	93.0	85.9	89.45	~ all over	1.02	N. E.
20	28.995	91.0	89.6	82.0	91.0	84.5	87.75	Ditto [over	..	N.
21	28.915	93.0	93.0	82.0	92.8	84.4	88.6	~ scattered all	..	N.
22	28.903	93.0	94.0	82.0	93.6	86.6	90.1	~ ditto	..	N. E.
23	28.973	93.0	95.5	81.5	95.0	86.7	90.85	~ scattered	..	N.
24	28.955	92.0	98.0	84.3	98.0	90.3	94.15	~ scattered	..	W.
25	28.909	92.0	99.4	85.9	99.2	90.6	94.9	Hazy	..	W.
26	28.975	97.0	104.0	83.0	103.4	93.6	98.5	Ditto [over	..	N.W.
27	29.037	95.6	93.9	84.0	94.0	92.4	93.2	~ scattered all	..	N.W.
28	28.945	95.5	94.2	88.0	95.5	89.0	92.25	~ all over	..	E.
29	28.985	92.7	91.0	79.0	95.5	85.0	90.25	~ to S. & W.	..	N.W.
30	29.019	88.5	87.9	82.0	92.4	82.9	87.65	~ all over	1.05	N. E.
Mean.	28.993	93.3	101.9	81.05	102.5	90.9	96.7	....	2.25	..

*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of July, 1853.*

Maximum pressure observed at 9.50 A. M.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Direction of the Wind.	
1	29.077	89.0	88.1	84.0	..	..	N.	☼ to W. ☼ to E.
2	29.069	87.7	85.9	82.9	..	..	S. E	☼ all over
3	29.135	89.9	88.0	84.0	..	..	E.	☼ scattered
4	29.133	89.5	88.3	83.6	..	..	S. E.	☼ all over
5	29.029	89.9	88.6	82.7	..	..	S. E	☼ all over
6	29.025	86.1	85.5	82.6	..	..	S. W.	Ditto
7	29.101	85.4	83.5	81.5	..	..	S. E.	Ditto
8	29.069	87.0	85.2	82.8	..	..	Lull.	Ditto
9	29.033	84.0	83.1	79.9	..	..	Do.	Ditto
10	28.943	86.2	86.5	80.5	..	..	N. W.	Ditto
11	29.011	82.9	79.0	77.9	..	..	N.	Ditto
12	29.015	88.0	88.0	83.8	..	..	N.	Ditto
13	29.057	86.8	86.0	81.7	..	..	E.	☼ in horizon
14	29.069	87.9	88.3	81.8	..	..	E.	☼ scattered
15	29.123	87.0	86.6	82.5	..	..	N. E.	☼ scattered
16	29.129	89.5	91.1	83.6	..	..	W.	Ditto
17	29.159	89.0	84.6	82.0	..	..	N. W.	☼ all over
18	29.165	87.0	85.6	80.0	..	..	N.	Ditto
19	29.135	84.7	83.6	79.4	..	..	N. W.	Ditto
20	29.043	86.2	87.4	81.8	..	..	W.	☼ scattered
21	29.067	87.0	87.8	81.7	..	..	W.	Ditto
22	29.135	86.0	86.0	82.9	..	..	W.	Ditto
23	29.157	88.3	85.4	81.5	..	..	S. E.	Raining.
24	29.167	86.5	83.1	80.9	..	..	N.	☼ all over
25	29.083	82.0	82.0	80.4	..	..	W.	Raining.
26	29.105	84.0	83.7	77.5	..	..	S. W.	☼ scattered
27	29.151	83.1	82.9	77.5	..	..	W.	Hazy
28	29.117	84.5	85.0	78.0	..	..	N. W.	Ditto
29	29.185	85.0	85.5	78.4	..	..	W.	☼ in zenith
30	29.145	85.0	86.3	78.5	..	..	W.	Clear
31	29.105	87.0	87.5	78.4	..	..	N. W.	Ditto
Mean.	29.095	86.5	85.7	81.1	..	..	..	....



*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of July, 1853.*

Observations at apparent Noon.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Direction of the Wind.	
1	29.059	85.5	84.2	81.4	..	..	S. E.	☼ all over
2	29.051	89.0	88.0	83.2	..	..	S. E.	☼ to N.
3	29.105	90.0	88.5	84.0	..	..	E.	☼ all over
4	29.085	90.5	90.3	84.0	..	..	S. E.	☼ scattered
5	29.005	88.4	88.6	84.0	..	..	S. E.	☼ all over
6	29.023	86.5	86.0	82.6	..	..	W.	Ditto
7	29.091	86.0	84.4	81.5	..	..	S. E.	Ditto
8	29.023	86.6	85.0	82.7	..	..	E.	Ditto
9	28.997	86.0	86.3	80.9	..	..	N.	Ditto
10	28.931	86.5	86.8	80.9	..	..	N.W.	Ditto
11	28.993	83.5	79.5	77.8	..	..	N.	Ditto
12	29.007	87.0	86.7	82.8	..	..	N.	Ditto
13	29.039	87.5	87.5	81.0	..	..	E.	☼ in horizon
14	29.055	89.0	89.8	81.9	..	..	E.	☼ all over
15	29.113	88.0	88.4	82.7	..	..	N. E.	☼ scattered
16	29.113	91.0	91.5	83.4	..	..	W.	Ditto
17	29.147	89.9	85.4	82.0	..	..	N.W.	☼ all over
18	29.141	87.2	87.5	81.0	..	..	N.	Ditto
19	29.115	85.6	85.3	81.5	..	..	W.	Ditto
20	29.019	88.0	83.4	81.5	..	..	W.	☼ scattered
21	29.053	88.0	88.5	81.5	..	..	N.W.	☼ all over
22	29.117	88.0	88.9	83.2	..	..	N. E.	Ditto
23	29.125	87.8	85.6	82.0	..	..	N. E.	Raining
24	29.135	87.0	85.4	82.0	..	..	N.	☼ all over
25	29.073	83.1	82.2	81.0	..	..	N.W.	Raining
26	29.097	85.0	84.4	78.8	..	..	W.	☼ scattered
27	29.143	85.0	84.8	78.8	..	..	W.	Hazy
28	29.117	86.0	86.5	78.5	..	..	N.W.	Ditto
29	29.165	87.0	87.4	79.2	..	..	W.	☼ in zenith
30	29.133	88.0	89.0	79.1	..	..	W.	Clear
31	29.089	87.0	89.4	79.1	..	..	N.W.	Ditto
Mean.	29.076	87.3	86.9	80.8	..	..	..	....

*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of July, 1853.*

• Minimum pressure observed at 4 P. M.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.	Rain Gauges.	
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Mean.		3 Ft. 2 In. from the ground.	Direction of the Wind.
1	29.013	86.0	83.0	80.5	87.9	84.0	85.95	☾ all over	1.07	E.
2	28.982	90.6	90.4	85.0	89.5	81.3	85.4	☾ to N.	0.22	E.
3	29.029	90.0	93.9	82.9	92.9	81.4	87.15	☾ in horizon	..	E.
4	29.005	90.1	89.0	83.5	90.5	82.9	86.7	☾ all over	0.37	S. E.
5	28.969	89.0	84.2	81.0	89.0	84.2	86.6	Ditto	..	N.
6	28.995	87.0	86.5	82.7	86.0	82.9	84.45	Ditto	..	S. W.
7	29.031	86.5	85.0	81.7	86.0	80.0	83.0	Ditto	3.27	E.
8	28.985	87.8	85.0	78.5	84.5	80.4	82.45	Ditto	0.09	E.
9	28.891	87.0	86.6	80.5	85.9	78.9	82.4	Ditto	0.49	N.
10	28.905	87.0	87.5	81.0	87.0	78.8	82.9	Ditto	..	N. W.
11	28.949	86.5	85.6	81.9	85.5	76.8	81.15	Ditto	0.24	N.
12	28.943	88.8	88.2	83.9	87.5	80.8	84.15	Ditto	..	N.
13	28.977	88.9	89.0	81.7	88.6	82.0	85.3	☾ scattered	0.19	E.
14	29.011	89.6	90.5	82.0	89.3	82.0	85.65	☾ all over	..	E.
15	29.053	90.7	90.5	83.5	89.8	81.8	85.8	☾ scattered	0.17	E.
16	29.063	84.0	94.6	84.3	94.0	84.5	89.25	☾ to S.	..	N. W.
17	29.105	89.5	84.9	80.7	85.5	82.7	84.1	☾ all over	..	N. W.
18	29.081	88.0	86.0	81.6	88.4	81.9	85.15	Raining	..	N. W.
19	29.033	87.0	86.0	81.9	85.6	81.3	83.35	☾ all over	0.15	N. W.
20	28.957	89.9	90.3	82.0	89.6	81.0	85.3	☾ to S.	..	W.
21	28.995	85.5	84.5	81.7	89.6	82.7	86.15	Raining	1.57	W.
22	29.055	83.0	83.5	81.0	89.0	82.3	85.65	☾ all over	.22	N.
23	29.079	88.0	85.0	82.1	90.0	81.7	85.85	Ditto	0.72	N. E.
24	29.059	87.2	88.0	83.0	87.8	81.5	84.65	☾ all over	0.32	W.
25	29.011	84.5	85.4	78.6	84.5	81.5	83.0	☾ in horizon	0.40	W.
26	29.073	86.7	85.5	79.9	84.5	79.8	82.15	☾ scattered	..	W.
27	29.085	88.0	86.7	79.0	85.5	80.0	82.75	Hazy	..	W.
28	29.059	89.1	88.0	79.8	85.5	79.9	82.7	☾ to N.	..	N. W.
29	29.117	90.0	89.4	79.4	87.0	80.3	83.65	Few ☾ scattered	..	N. W.
30	29.069	91.2	90.6	79.1	88.0	80.4	84.2	Clear	..	W.
31	29.027	88.0	91.0	80.1	88.9	81.9	85.4	Ditto	..	N. W.
Mean.	29.020	88.4	87.7	81.4	87.8	81.3	84.6	....	9.49	..

*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of August, 1853.*

Maximum pressure observed at 9.50 A. M.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Direction of the Wind.	
1	29.135	86.5	87.7	77.9	..	..	N.W.	Clear
2	29.191	87.0	88.6	79.0	..	..	W.	~ all over
3	29.209	87.0	89.0	78.7	..	..	W.	Clear
4	29.209	87.2	89.0	82.8	..	..	W.	Ditto
5	29.180	87.6	89.4	79.3	..	..	W.	Ditto
6	29.199	87.0	89.4	78.4	..	..	W.	Ditto
7	29.197	88.0	89.0	75.0	..	..	N.W.	Ditto
8	29.191	88.8	89.9	75.6	..	..	..	Ditto
9	29.217	88.0	89.5	76.0	..	..	W.	Ditto
10	29.271	88.8	91.1	78.5	..	..	N.W.	Hazy to E.
11	29.269	88.9	91.2	78.9	..	..	W.	~ scattered all over
12	29.339	90.0	91.0	79.9	..	..	N.	~ scattered
13	29.309	91.5	94.2	79.9	..	..	W.	~ditto
14	29.209	91.5	95.5	78.0	..	..	N.W.	A few ~ to N.
15	29.223	89.0	91.2	79.0	..	..	W.	Hazy
16	29.243	88.9	90.9	77.5	..	..	W.	~ in zenith
17	29.297	90.5	93.5	76.4	..	..	N.	~ scattered
18	29.329	90.0	92.0	76.3	..	..	N.W.	~ all over
19	29.265	90.0	92.2	81.2	..	..	N.W.	Clear
20	29.205	92.4	95.1	79.0	..	..	W.	Ditto
21	29.137	92.5	94.4	78.6	..	..	N.W.	Hazy
22	29.165	90.5	91.7	77.5	..	..	N.W.	~ in zenith
23	29.157	91.1	92.1	80.7	..	..	N.W.	~ to South
24	29.243	90.7	90.2	80.5	..	..	N. E.	~ scattered
25	29.249	90.6	91.2	81.4	..	..	N. E.	Ditto
26	29.225	95.0	93.5	81.0	..	..	N.W.	~ scattered in zenith
27	29.167	96.0	95.7	78.5	..	..	N.W.	Clear
28	29.200	95.1	94.8	78.6	..	..	N.	Ditto
29	29.239	92.7	89.4	82.9	..	..	N. E.	~ towards S. [all over
30	29.226	90.0	88.8	82.5	..	..	E.	Ditto N. E. and ~scattered
31	29.221	93.0	91.7	81.9	..	..	S. E.	~ scattered all over
Mean.	29.223	90.2	91.4	79.1	..	..	..	....

*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of August, 1853.*

## Observations at apparent Noon.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Direction of the Wind.	
1	29.119	88.8	89.5	78.1	..	..	N.W.	Clear
2	29.183	88.6	89.7	79.0	..	..	W.	~ all over
3	29.203	89.4	90.5	79.4	..	..	W.	~ scattered
4	29.197	89.9	91.3	80.5	..	..	W.	Clear
5	29.165	90.0	91.8	80.0	..	..	W.	Ditto
6	29.141	90.5	91.5	78.2	..	..	W.	Ditto
7	29.079	88.9	91.4	75.0	..	..	N.W.	Ditto
8	29.169	90.2	92.2	76.6	..	..	N.W.	Few ~ scattered
9	29.203	90.4	92.6	78.6	..	..	N.W.	Clear
10	29.263	91.4	93.6	78.6	..	..	W.	Hazy to E.
11	29.261	92.0	93.0	77.5	..	..	W.	~ scattered all over
12	29.319	90.8	92.2	79.5	..	..	N.	~ scattered
13	29.279	93.8	96.3	78.8	..	..	N.W.	~ ditto
14	29.193	92.0	96.4	78.0	..	..	N.W.	A few ~ to N.
15	29.205	90.8	92.7	78.0	..	..	..	Hazy
16	29.233	91.2	93.7	77.5	..	..	N.	~ scattered in zenith
17	29.269	92.0	95.3	77.1	..	..	N.W.	~ scattered
18	29.305	92.0	93.0	79.0	..	..	W.	~ all over
19	29.233	92.0	95.3	81.0	..	..	N.W.	~ scattered
20	29.167	94.0	98.5	79.4	..	..	W.	Clear
21	29.111	93.0	95.0	79.0	..	..	W.	Hazy
22	29.135	93.0	94.7	81.8	..	..	N.	~ scattered
23	29.131	93.0	95.0	80.2	..	..	N.	~ ditto
24	29.219	92.5	92.2	79.5	..	..	N.E.	Ditto
25	29.235	95.0	93.8	80.5	..	..	N.E.	Ditto
26	29.181	98.9	100.0	81.0	..	..	N.W.	Ditto
27	29.143	99.8	99.8	78.5	..	..	N.W.	Clear
28	29.181	98.0	97.8	78.3	..	..	N.W.	Ditto
29	29.219	93.7	91.9	82.5	..	..	N.	~ towards N.
30	29.205	91.8	90.2	81.5	..	..	E.	~ scattered all over
31	29.197	95.5	95.5	82.1	..	..	..	Ditto
Mean.	29.199	92.4	93.8	79.2	..	..	..	....

*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of Aug. 1853. LONGITUDE.*

Minimum pressure observed at 4 P. M.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.	Rain Gauges.	
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Mean.		3 Ft 2 In. from the ground.	Direction of the Wind.
1	29.085	89.0	89.5	79.2	89.7	81.9	85.8	~ all over	..	N.W.
2	29.119	91.6	91.6	79.0	90.5	81.9	86.2	Ditto	..	N.W.
3	29.155	91.0	91.7	79.8	89.4	82.5	85.95	~ scattered	..	N.W.
4	29.127	92.5	93.4	80.5	92.1	83.4	87.8	Clear	..	N.W.
5	29.099	93.8	93.6	80.0	92.4	83.7	88.1	Ditto	..	N.W.
6	29.075	91.0	93.6	77.0	91.2	83.0	87.1	Ditto	..	N.W.
7	29.077	89.6	93.0	76.3	91.5	83.2	87.4	Ditto	..	N.W.
8	29.109	92.9	94.0	76.8	92.0	82.3	87.15	Ditto	..	N.W.
9	29.163	94.1	95.1	79.4	92.7	83.0	87.85	Ditto	..	N.W.
10	29.175	94.6	94.6	79.0	92.6	83.4	87.5	~ scattered	..	N.W.
11	29.193	93.0	94.6	78.0	92.4	83.6	88.0	~ s. atd. all o'er	..	W.
12	29.239	92.0	93.0	80.3	91.7	86.6	89.15	~ scattered	..	N.
13	29.183	94.0	97.4	79.0	95.0	86.5	90.75	~ ditto	..	N.W.
14	29.095	92.2	97.8	78.6	95.2	87.0	91.1	Few ~ scattered	..	N.W.
15	29.131	93.0	93.9	78.4	95.0	86.2	90.6	~ all over	..	W.
16	29.205	94.0	96.0	77.8	95.0	84.0	89.5	~ scatd. in Z.	..	N.
17	29.189	94.0	96.7	77.7	94.5	83.8	89.15	~ scattered	..	N.W.
18	29.209	93.9	94.4	80.2	93.1	83.0	88.5	~ all over	..	N.E.
19	29.145	93.7	94.9	79.5	94.0	86.5	90.25	~ towards E.	..	N.W.
20	29.075	94.0	100.4	79.5	98.2	86.8	92.5	~ to west	..	W.
21	29.059	93.0	97.3	79.6	95.1	88.7	91.9	Ditto	..	W.
22	29.079	93.1	95.0	79.3	95.2	86.6	90.9	Few ~ scatd.	..	E.
23	29.079	94.0	95.4	79.5	95.5	87.2	91.35	~ scattered	..	N.W.
24	29.193	93.0	92.6	79.5	95.2	85.0	85.1	Ditto	..	N.E.
25	29.127	99.5	96.6	78.9	95.0	84.0	89.5	~ scattered	..	N.
26	29.079	101.0	101.4	82.0	101.6	83.5	92.55	~ ditto	..	N.E.
27	29.029	105.7	103.2	81.0	103.0	87.3	95.15	Clear	..	N.
28	29.085	105.0	102.7	80.6	101.7	86.2	93.95	Ditto	..	W.
29	29.155	87.8	83.5	79.1	101.9	87.2	94.55	~ all over	..	W.
30	29.119	98.0	95.2	81.8	101.5	86.2	93.85	~ scatd. all o'er	..	E.
31	29.047	101.6	100.0	82.9	101.8	81.2	91.0	Ditto	..	..
Mean.	29.126	94.4	95.2	79.4	94.7	84.7	89.7	....	..	..



*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of September, 1853.*

Maximum pressure observed at 9.50 A. M.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Direction of the Wind.	
1	29.279	96.0	95.4	82.4	..	..	E.	~ scattered
2	29.231	95.6	95.0	84.0	..	..	N. E.	Ditto
3	29.213	94.0	93.0	82.0	..	..	S. E.	Ditto
4	29.275	91.5	92.0	81.6	..	..	E.	~ scattered
5	29.271	90.5	91.2	83.4	..	..	E.	~ ditto
6	29.171	92.7	93.2	80.4	..	..	N.W.	Clear
7	29.139	91.0	91.4	78.5	..	..	N.W.	Hazy
8	29.173	90.0	90.4	78.0	..	..	N.W.	Clear
9	29.201	88.0	88.6	76.7	..	..	N.W.	Ditto
10	29.235	87.9	88.3	76.4	..	..	N.W.	Ditto
11	29.173	86.8	87.5	76.2	..	..	N.	Ditto
12	29.223	89.0	89.6	76.5	..	..	N.W.	Ditto
13	29.257	91.7	91.9	77.0	..	..	N.W.	~ scattered
14	29.303	92.0	92.7	75.3	..	..	N.W.	Clear
15	29.325	92.5	93.3	75.6	..	..	N.W.	Ditto
16	29.341	92.0	92.2	75.6	..	..	N.W.	~ scattered
17	29.369	91.0	91.8	75.3	..	..	N.W.	Ditto
18	29.385	89.4	90.2	74.9	..	..	N.W.	Clear
19	29.367	90.0	90.5	76.5	..	..	N.W.	~ scattered
20	29.373	89.0	89.5	76.5	..	..	N.W.	Ditto
21	29.377	88.0	88.6	75.0	..	..	N.W.	Clear
22	29.385	89.5	89.6	75.4	..	..	N.	~ scattered
23	29.397	90.0	90.5	76.4	..	..	N.W.	Clear
24	29.341	90.7	91.4	75.0	..	..	N.W.	Ditto
25	29.329	92.0	92.3	76.8	..	..	N. E.	Ditto
26	29.311	91.7	92.8	79.4	..	..	S. E.	Ditto
27	29.257	92.5	93.0	74.2	..	..	S.W.	Ditto
28	29.261	90.8	91.5	72.5	..	..	N. E.	Ditto
29	29.277	88.9	89.5	76.4	..	..	S. E.	~ towards E.
30	29.313	88.6	88.8	78.0	..	..	W.	~ few scattered
Mean.	29.285	90.78	91.19	97.40	..	..	..	....

*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of Sept. 1853.*

Observations at apparent Noon.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Direction of the Wind.	
1	29.229	97.5	97.3	83.5	..	..	E.	~ scattered
2	29.205	95.9	94.8	84.0	..	..	N. E.	Ditto
3	29.197	95.8	95.8	81.5	..	..	N. W.	Ditto
4	29.253	92.8	94.0	82.0	..	..	E.	^ all over
5	29.231	92.5	92.3	83.0	..	..	E.	^ all over
6	29.141	95.6	96.7	79.0	..	..	N. W.	^ scattered
7	29.123	95.0	95.5	79.5	..	..	N. W.	Hazy
8	29.147	93.9	94.5	78.9	..	..	N. W.	^ very few scattered
9	29.201	91.6	92.5	78.0	..	..	N. W.	~ scattered
10	29.231	91.4	91.8	74.9	..	..	N. W.	Clear
11	29.151	91.0	91.7	76.4	..	..	W.	Ditto
12	29.215	93.0	93.9	75.6	..	..	N. W.	Ditto
13	29.247	94.8	95.4	76.4	..	..	N. W.	^ scattered
14	29.297	96.7	97.3	75.4	..	..	N. W.	Clear
15	29.315	96.0	96.8	74.8	..	..	N. W.	Ditto
16	29.323	95.0	95.9	75.6	..	..	N. W.	Ditto
17	29.359	93.0	93.1	73.8	..	..	N. W.	^ scattered
18	29.365	92.3	92.0	75.0	..	..	N. W.	Clear
19	29.325	94.5	94.5	74.3	..	..	N. W.	~ scattered
20	29.357	91.2	91.5	75.4	..	..	N. W.	Ditto
21	29.365	91.0	91.8	75.6	..	..	N. W.	Ditto
22	29.355	91.5	92.4	74.5	..	..	N. W.	Ditto
23	29.373	92.5	93.0	76.4	..	..	N. W.	Ditto
24	29.315	91.5	94.0	74.5	..	..	N. W.	^ ditto
25	29.305	95.8	96.0	74.5	..	..	N. E.	^ in horizon towards E.
26	29.267	94.5	95.2	74.9	..	..	E.	Clear
27	29.235	94.0	94.8	74.6	..	..	..	Ditto
28	29.237	93.9	94.7	72.7	..	..	..	Ditto
29	29.237	92.7	93.0	76.7	..	..	N. W.	Ditto
30	29.303	92.0	92.5	78.6	..	..	W.	^ few scattered
Mean.	29.263	93.66	94.16	77.00	..	..	..	....

*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of Sept. 1853.*

Minimum pressure observed at 4 P. M.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.	Rain Gauges.	
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Mean.		3 Ft. 2 In. from the ground.	Direction of the Wind.
1	29.111	99.6	98.9	83.5	99.1	81.3	90.2	∧ scattered	..	E.
2	29.111	94.8	90.6	80.2	99.9	85.5	92.65	∨ all over	..	N. E.
3	29.133	94.2	91.9	81.5	91.0	82.6	86.8	Ditto	..	N. E.
4	29.159	92.3	92.0	81.9	93.2	82.0	87.5	Ditto	..	E.
5	29.153	94.0	93.7	83.0	93.3	83.5	88.4	Ditto	..	E.
6	29.041	100.8	101.5	79.6	99.4	83.0	91.2	Clear	..	W.
7	29.033	100.0	101.0	79.8	100.8	85.5	93.15	Hazy [scatd.	..	N.W.
8	29.125	97.3	98.5	79.6	98.8	82.0	90.4	∨ very few	..	N.W.
9	29.145	96.0	96.0	78.0	99.0	81.0	90.0	∧ scattered	..	N.W.
10	29.161	96.0	95.8	76.6	94.9	79.0	86.95	Clear	..	W.
11	29.133	96.4	96.2	76.6	95.1	80.0	87.55	Ditto	..	N.W.
12	29.195	97.0	96.6	76.0	97.0	80.0	88.5	Ditto	..	N.W.
13	29.137	97.0	97.2	76.5	96.0	80.0	88.0	∨ all over	..	W.
14	29.237	99.0	99.0	76.0	97.9	83.9	90.9	Ditto	..	N.W.
15	29.245	99.4	98.6	75.0	98.0	82.8	90.4	Clear	..	N.W.
16	29.237	98.5	98.7	77.5	97.5	82.8	90.15	∨ towards E.	..	..
17	29.251	97.6	97.9	74.0	98.0	82.3	90.15	∨ scattered	..	N.W.
18	29.301	96.3	93.7	76.0	95.3	81.0	88.15	∧ all over	..	N.W.
19	29.263	95.0	94.5	75.6	95.3	82.0	88.65	∧ scattered	..	N.W.
20	29.267	94.0	92.5	76.5	92.0	81.0	86.5	Ditto	..	N.W.
21	29.279	94.0	92.4	76.1	92.0	81.5	86.75	Ditto	..	N.
22	29.295	94.1	94.8	75.4	93.8	81.3	87.55	Ditto	..	N.W.
23	29.297	96.7	97.4	76.2	95.8	81.5	88.65	Ditto	..	N.
24	29.237	94.7	98.2	74.5	96.5	82.0	89.25	∧ ditto	..	N.
25	29.235	98.0	98.5	75.0	97.3	82.8	90.55	∧ in horz. to-	..	N.
26	29.175	99.1	98.0	79.0	97.0	83.0	90.0	Clear[wards E.	..	E.
27	29.111	98.6	97.9	75.0	97.6	83.0	90.3	Ditto	..	..
28	29.171	97.6	98.0	72.9	97.9	81.0	89.45	Ditto	..	..
29	29.191	95.5	96.1	78.5	98.4	82.8	90.6	Ditto	..	N.W.
30	29.237	98.5	98.5	78.4	97.2	81.6	89.4	Ditto	..	N.W.
Mean.	29.189	96.63	96.53	77.48	96.50	82.06	89.28	....	..	..

*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of October, 1853.*

Maximum pressure observed at 9.50 A. M.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Direction of the Wind.	
1	29.327	89.0	89.7	72.1	..	..	N. E.	Clear
2	29.265	93.0	93.6	71.0	..	..	W.	Ditto
3	29.325	90.8	91.9	74.4	..	..	N. E.	Ditto
4	29.343	90.5	90.5	74.2	..	..	N. E.	^ scattered
5	29.311	88.0	88.3	79.5	..	..	N. E.	^ all over
6	29.299	79.0	78.2	75.0	..	..	E.	Ditto
7	29.191	75.5	75.3	74.3	..	..	E.	Raining
8	29.319	77.0	77.2	74.5	..	..	W.	^ all over
9	29.411	76.4	76.6	74.0	..	..	N.W.	Ditto
10	29.505	75.5	76.0	72.0	..	..	N.W.	^ scattered
11	29.573	78.9	79.6	73.0	..	..	N.W.	Clear
12	29.445	82.5	83.3	70.0	..	..	S.W.	Ditto
13	29.447	82.2	82.5	68.1	..	..	W.	Ditto
14	29.497	80.0	80.6	68.2	..	..	N.W.	Ditto
15	29.549	80.0	81.0	66.0	..	..	N.W.	Ditto
16	29.580	81.2	81.7	68.0	..	..	W.	Ditto
17	29.599	82.5	83.0	66.0	..	..	W.	Ditto
18	29.569	81.6	82.6	66.4	..	..	N.	Ditto
19	29.531	78.4	79.3	63.0	..	..	N.W.	Ditto
20	29.507	78.2	79.0	64.0	..	..	W.	Ditto
21	29.527	79.0	80.2	63.3	..	..	W.	Ditto
22	29.499	84.6	85.0	63.4	..	..	W.	Ditto
23	29.517	79.6	80.6	66.6	..	..	W.	Ditto
24	29.559	79.5	81.0	67.4	..	..	W.	Ditto
25	29.529	79.6	80.7	67.0	..	..	S.W.	Ditto
26	29.511	81.0	82.5	64.8	..	..	W.	Ditto
27	29.637	80.5	81.5	67.0	..	..	S.	Ditto
28	29.635	79.8	80.9	66.0	..	..	W.	Ditto
29	29.599	79.0	80.9	66.0	..	..	N.W.	Ditto
30	29.593	82.2	83.0	67.0	..	..	W.	Ditto
31	29.617	81.5	82.8	69.0	..	..	N.W.	Ditto
Mean.	29.482	81.5	82.2	69.1	..	..	..	....

*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of Oct. 1853.*

Observations at apparent Noon.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Direction of the Wind.	
1	29.289	93.0	93.6	72.4	..	..	N. E.	Few ~ scattered
2	29.301	95.2	95.5	71.5	..	..	W.	Clear
3	29.245	93.0	93.3	75.0	..	..	N. E.	Ditto
4	29.307	93.0	93.5	74.8	..	..	N. E.	~ scattered
5	29.273	90.0	88.7	79.2	..	..	N. E.	~ all over
6	29.259	80.1	79.5	75.8	..	..	E.	Ditto
7	29.173	75.9	75.5	73.5	..	..	E.	Raining
8	29.337	78.9	78.6	75.5	..	..	W.	~ all over
9	29.393	78.0	78.5	74.2	..	..	N. W.	Ditto
10	29.489	79.9	80.0	72.9	..	..	N. W.	~ scattered
11	29.503	81.0	81.6	73.0	..	..	W.	Clear
12	29.415	85.5	85.5	70.5	..	..	N. W.	Ditto
13	29.421	85.2	85.5	68.1	..	..	W.	Ditto
14	29.479	83.1	83.5	69.0	..	..	N. W.	Ditto
15	29.531	82.5	83.5	66.5	..	..	N. W.	Ditto
16	29.567	84.0	85.5	68.3	..	..	W.	Ditto
17	29.559	85.0	85.6	66.8	..	..	W.	Ditto
18	29.551	83.5	84.3	67.9	..	..	N. W.	Ditto
19	29.511	83.0	84.0	63.4	..	..	W.	Ditto
20	29.499	84.1	85.4	64.6	..	..	W.	Ditto
21	29.503	84.8	86.0	64.1	..	..	W.	Ditto
22	29.469	86.0	87.2	64.7	..	..	N. W.	Ditto
23	29.505	85.0	86.1	67.0	..	..	W.	Ditto
24	29.517	83.8	84.5	69.7	..	..	W.	Ditto
25	29.505	84.0	84.7	67.8	..	..	W.	Ditto
26	29.493	84.8	85.5	65.5	..	..	W.	Ditto
27	29.607	84.0	85.0	67.2	..	..	W.	Ditto
28	29.605	86.0	87.2	66.1	..	..	N. W.	Ditto
29	29.557	85.0	86.4	67.0	..	..	N. W.	Ditto
30	29.559	84.0	85.0	67.0	..	..	W.	Ditto
31	29.559	84.0	85.0	67.0	..	..	N. W.	Ditto
Mean.	29.450	84.7	85.3	69.5	..	..	..	....



*Meteorological Register kept at the Office of the Secretary to Government N. W. P. Agra, for the Month of Oct. 1853.*

Minimum pressure observed at 4 P. M.

Date.	Barometer.	Temperature.			Maximum and Minimum.			Aspect of the Sky.	Rain Gauges.	
		Of Mercury.	Of Air.	Wet Bulb.	Maximum.	Minimum.	Mean.		3 Ft. 2 In. from the ground.	Direction of the Wind.
1	29.171	96.0	96.4	72.7	98.2	79.0	88.6	Few \ scattered	..	E.
2	29.237	96.8	97.1	71.8	96.0	79.0	87.5	Clear	..	W.
3	29.251	96.7	96.9	73.4	95.5	86.5	91.0	^ scattered	..	N. E.
4	29.247	95.0	95.4	74.4	94.0	86.5	90.25	Ditto	..	N. E.
5	29.263	93.0	93.4	82.7	94.0	89.0	91.5	^ all over	..	N. E.
6	29.241	83.5	84.0	76.0	84.0	81.0	82.5	....	..	E.
7	29.101	76.4	75.7	74.5	76.6	74.0	75.3	Raining	..	E.
8	29.339	77.8	77.5	74.9	79.0	73.5	76.25	^ all over	..	W.
9	29.371	78.8	79.1	74.8	80.5	73.9	77.2	Ditto	..	W.
10	29.443	83.8	84.0	74.5	82.2	69.0	75.6	^ scattered	..	N.W.
11	29.389	87.2	87.6	73.6	85.6	68.8	77.2	Clear	..	W.
12	29.381	89.3	89.6	70.0	87.9	71.2	79.55	Ditto	..	N.W.
13	29.387	90.4	90.0	70.9	88.9	71.5	80.2	Ditto	..	W.
14	29.459	88.0	87.2	67.0	88.2	68.9	78.55	Ditto	..	..
15	29.503	87.0	86.7	66.6	88.0	69.0	78.5	Ditto	..	N.W.
16	29.527	88.4	88.6	68.7	88.5	69.0	78.75	Ditto	..	N.W.
17	29.525	88.5	88.8	68.0	87.4	73.6	80.5	Ditto	..	W.
18	29.489	89.0	89.0	68.9	87.6	73.0	80.3	Ditto	..	N.W.
19	29.429	88.8	88.2	65.0	87.0	67.0	77.0	Ditto	..	W.
20	29.453	89.5	89.9	65.0	87.2	67.3	77.25	Ditto	..	N.W.
21	29.455	90.0	90.5	64.5	88.2	67.2	77.7	Ditto	..	W.
22	29.435	91.1	91.4	68.0	89.4	67.0	78.2	Ditto	..	N.W.
23	29.467	90.0	90.6	68.3	88.9	71.0	79.95	Ditto	..	W.
24	29.465	89.5	90.1	69.1	88.0	70.5	79.25	Ditto	..	N.W.
25	29.455	90.0	90.5	69.0	88.5	70.5	79.5	Ditto	..	W.
26	29.459	90.8	91.6	69.0	89.2	69.9	79.55	Ditto	..	W.
27	29.569	90.5	91.0	67.9	89.4	73.5	81.45	Ditto	..	S.
28	29.553	91.0	91.3	67.0	90.5	71.0	80.75	Ditto	..	N.W.
29	29.507	90.3	90.6	68.0	89.6	71.0	80.3	Ditto	..	N.W.
30	29.477	88.5	89.4	67.5	88.4	69.0	78.7	Ditto	..	W.
31	29.527	88.0	88.0	70.0	87.5	68.5	78.0	Ditto	..	N.W.
Mean.	29.406	88.8	89.1	70.4	88.2	72.9	80.54	....	..	..

*Errata in Vol. XXII. for 1853, (Nos. 3, 4 & 5) of the Journal of Asiatic Society, in the paper entitled "Report on the Geological Structure, &c. of the Salt Range in the Punjaub, &c."*

Page	line
258	18, for Soda read Lead.
334	30, for Likesur read Sikesur.
335	35, for thin read their.
"	37, for Kathee read Kotkee.
336	2, for Chotab read Chotah.
"	3, for Soan read Loon.
"	" for Marie read Maree.
"	6, for Ral read Rol.
"	25, for ditto read ditto.
337	17, for Jumsan read Jumsau.
"	20, for apparance read appearance.
"	27, for devoid read derived.
338	8, for Jumsan read Jumsau.
"	27, for Cents. read Cwts.
"	29, for Kathee read Kotkee.
339	3, for Jumsan read Jumsau.
"	16, for Kathee read Kotkee.
"	25, for Jumsan read Jumsau.
340	5, for ditto read ditto.
341	8, for clay sandstone read claystone.
"	16, for sandstone read sandstones.
342	15 for Shob read Shah.
"	33, for Rhutlum read Ruttibun.
343	11, for Kurrah read Keurah.
"	14, for Taber read Tober.
"	34, for Demdhote read Dimdhote.
344	13, for Kurrumea Wou read Kurrumea Wan.
"	28, for Kathee read Kotkee.
"	32, for ditto read ditto.
345	3, for ditto read ditto.
"	29, insert a point after coal.
"	" for small read Small.
346	10, for Kathee read Kotkee.
"	23, for ditto read ditto.
347	1, for ditto read ditto.
"	9, for Brattenberg read Beattenberg.
"	16, for ditto read ditto.
349	2, for coating read luting.
"	14, for Fascialites read Fasciolites.
"	16, for Aeritina read Neritina.
350	14, for when read where.
"	29, for Gharigulla read Ghorigulla.
"	34, for ditto read ditto.
"	" for Bulerala read Bukralla.
351	7, for Sam read Sone.
"	35, for identified read identical.
352	3, for Mochpoor read Mochpoora.
354	2, for Buhrala read Bukralla.
355	13, for Kuttree read Puttree.
"	33, for with read into.
357	4, for Carapax read Carapace.
"	13, for endogenous read exogenous.
"	24, for eastward read east.
"	36, for formed read forced.
358	15, for axis read axes.
"	24, for Sekesur read Sikesur.

Page	line	
„	33,	for 2113 feet. Above read 2113 feet above.
„	34,	after Maree insert a point.
„	„	for looking read looking, and omit ; after summit.
360	11,	for grove read zone.
„	15,	after mountains insert would.
363	17,	for alluvion read alluvium.
„	22,	for Siberian read Silurian.
„	24,	for hard read hand.
366	36,	for oolitics read oolites.
367	2,	for 18° read 180°.
„	5,	for Kothee read Kotkee.
368	15,	for Kurum read Koorum.
„	25,	for fossil read fossils.
445	8,	for pelu read peelu.
„	„	for mud read mudar.
„	13,	for as read so.
446	15 and 16,	for detritic read dentritic.
447	9,	for vein read veins.
„	31,	for Gurjok read Gurjak.
448	2,	for Leyden read Seyden.
„	5,	for Dhur read Dhar.
„	8,	for Soue read Sone.
„	9,	for Moosoul read Moosral.
„	19,	for 4,493 read 493.
„	40,	for render read renders.
449	9,	for Kothee read Kotkee.
„	19,	for Lingasun read Siagasun.
„	22,	for Arub read Amb.
451	24,	for rock read rack.
452	18,	for Deooman Rocks read Devonian Rocks in italics.
„	30,	for Kerah read Keurah.
453	11,	for Mukraih read Mukrach.
„	20,	for Arub read Amb.
„	25 and 26,	for glame read glance.
„	34,	after Agate insert .....
„	34 and 35,	Carboniferous Rocks, &c. in italics.
454	17,	Oolitic Secondary Rocks, &c. in italics.
„	21,	for Shah read Shales.
„	41,	for Intana read Jutana.
456	12,	after Lower Silurian or Cambrian Rocks insert ?
457	13,	for maps read mass.
„	25,	for Kuhar read Kuhan.
„	33,	for ditto read ditto.
458	4,	for Hoona read Hoon.

Chuprah, 26th January, 1854.

A. FLEMING.











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